

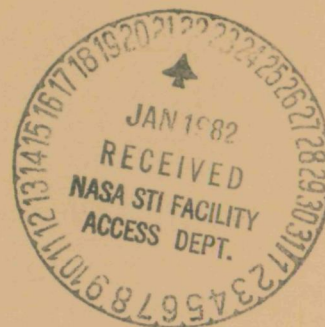


Aerospace Medicine  
and Biology  
A Continuing  
Bibliography  
with Indexes

NASA SP-7011 (226)  
December 1981



National Aeronautics and  
Space Administration



# Aerospace Medicine & Biology

## space Medicine & Biology Aero

### e M

#### dicine & Biology Aerospace M

##### ne & Biology Aerospace Medic

###### Biology Aerospace Medicine &

###### gy Aerospace Medicine & Biol

###### erospace Medicine & Biology

###### pace Medicine & Biology Aeros

###### Medicine & Biology Aerospace

###### cine & Biology Aerospace Me

###### & Biology Aerospace Medicine

(NASA-SP-7011 (226)) AEROSPACE MEDICINE AND  
BIOLOGY. A CONTINUING BIBLIOGRAPHY  
(SUPPLEMENT 226) (National Aeronautics and  
Space Administration) 48 p HC \$7.00

N82-16731

Unclas

CSCI 06E 00/52 07180



## ACCESSION NUMBER RANGES

Accession numbers cited in this Supplement fall within the following ranges.

STAR (N-10000 Series)    N81-30080 – N81-32113

IAA (A-10000 Series)    A81-43983 – A81-47132

# **AEROSPACE MEDICINE AND BIOLOGY**

## **A CONTINUING BIBLIOGRAPHY WITH INDEXES**

**(Supplement 226)**

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in November 1981 in

- *Scientific and Technical Aerospace Reports (STAR)*
- *International Aerospace Abstracts (IAA).*



Scientific and Technical Information Branch

**National Aeronautics and Space Administration**

Washington, DC

1981

NASA SP-7011 and its supplements are available from the National Technical Information Service (NTIS). Questions on the availability of the predecessor publications, Aerospace Medicine and Biology (Volumes I - XI) should be directed to NTIS.

This supplement is available as NTISUB/123/093 from the National Technical Information Service (NTIS), Springfield, Virginia 22161 at the price of \$7.00 domestic; \$14.00 foreign.

# INTRODUCTION

This Supplement to *Aerospace Medicine and Biology* (NASA SP-7011) lists 129 reports, articles and other documents announced during November 1981 in *Scientific and Technical Aerospace Reports (STAR)* or in *International Aerospace Abstracts (IAA)*. The first issue of the bibliography was published in July 1964; since that time, monthly supplements have been issued.

In its subject coverage, *Aerospace Medicine and Biology* concentrates on the biological, physiological, psychological, and environmental effects to which man is subjected during and following simulated or actual flight in the earth's atmosphere or in interplanetary space. References describing similar effects of biological organisms of lower order are also included. Such related topics as sanitary problems, pharmacology, toxicology, safety and survival, life support systems, exobiology, and personnel factors receive appropriate attention. In general, emphasis is placed on applied research, but references to fundamental studies and theoretical principles related to experimental development also qualify for inclusion.

Each entry in the bibliography consists of a bibliographic citation accompanied in most cases by an abstract. The listing of the entries is arranged in two major sections: *IAA Entries* and *STAR Entries*, in that order. The citations, and abstracts when available, are reproduced exactly as they appeared originally in *IAA* or *STAR*, including the original accession numbers from the respective announcement journals. This procedure, which saves time and money, accounts for the slight variation in citation appearances.

Two indexes -- subject and personal author -- are included.

An annual index will be prepared at the end of the calendar year covering all documents listed in the 1981 Supplements.

# AVAILABILITY OF CITED PUBLICATIONS

## IAA ENTRIES (A81-10000 Series)

All publications abstracted in this Section are available from the Technical Information Service, American Institute of Aeronautics and Astronautics, Inc. (AIAA), as follows: Paper copies of accessions are available at \$7.00 per document up to a maximum of 40 pages. The charge for each additional page is \$0.25. Microfiche<sup>(1)</sup> of documents announced in *IAA* are available at the rate of \$3.00 per microfiche on demand, and at the rate of \$1.25 per microfiche for standing orders for all *IAA* microfiche. The price for the *IAA* microfiche by category is available at the rate of \$1.50 per microfiche plus a \$1.00 service charge per category per issue. Microfiche of all the current AIAA Meeting Papers are available on a standing order basis at the rate of \$1.50 per microfiche.

Minimum air-mail postage to foreign countries is \$1.00 and all foreign orders are shipped on payment of pro-forma invoices.

All inquiries and requests should be addressed to AIAA Technical Information Service. Please refer to the accession number when requesting publications.

## STAR ENTRIES (N81-10000 Series)

One or more sources from which a document announced in *STAR* is available to the public is ordinarily given on the last line of the citation. The most commonly indicated sources and their acronyms or abbreviations are listed below. If the publication is available from a source other than those listed, the publisher and his address will be displayed on the availability line or in combination with the corporate source line.

Avail: NTIS. Sold by the National Technical Information Service. Prices for hard copy (HC) and microfiche (MF) are indicated by a price code followed by the letters HC or MF in the *STAR* citation. Current values for the price codes are given in the tables on page vii.

Documents on microfiche are designated by a pound sign (#) following the accession number. The pound sign is used without regard to the source or quality of the microfiche.

Initially distributed microfiche under the NTIS SRIM (Selected Research in Microfiche) is available at greatly reduced unit prices. For this service and for information concerning subscription to NASA printed reports, consult the NTIS Subscription Section, Springfield, Va. 22161.

NOTE ON ORDERING DOCUMENTS: When ordering NASA publications (those followed by the \* symbol), use the N accession number. NASA patent applications (only the specifications are offered) should be ordered by the US-Patent-Appl-SN number. Non-NASA publications (no asterisk) should be ordered by the AD, PB, or other *report* number shown on the last line of the citation, not by the N accession number. It is also advisable to cite the title and other bibliographic identification.

Avail: SOD (or GPO). Sold by the Superintendent of Documents, U.S. Government Printing Office, in hard copy. The current price and order number are given following the availability line. (NTIS will fill microfiche requests, at the standard \$3.50 price, for those documents identified by a # symbol.)

(1) A microfiche is a transparent sheet of film, 105 by 148 mm in size, containing as many as 60 to 98 pages of information reduced to micro images (not to exceed 26:1 reduction).

Avail: NASA Public Document Rooms. Documents so indicated may be examined at or purchased from the National Aeronautics and Space Administration, Public Documents Room (Room 126), 600 Independence Ave., S.W., Washington, D.C. 20546, or public document rooms located at each of the NASA research centers, the NASA Space Technology Laboratories, and the NASA Pasadena Office at the Jet Propulsion Laboratory.

Avail: DOE Depository Libraries. Organizations in U.S. cities and abroad that maintain collections of Department of Energy reports, usually in microfiche form, are listed in *Energy Research Abstracts*. Services available from the DOE and its depositories are described in a booklet, *DOE Technical Information Center - Its Functions and Services* (TID-4660), which may be obtained without charge from the DOE Technical Information Center.

Avail: Univ. Microfilms. Documents so indicated are dissertations selected from *Dissertation Abstracts* and are sold by University Microfilms as xerographic copy (HC) and microfilm. All requests should cite the author and the Order Number as they appear in the citation.

Avail: USGS. Originals of many reports from the U.S. Geological Survey, which may contain color illustrations, or otherwise may not have the quality of illustrations preserved in the microfiche or facsimile reproduction, may be examined by the public at the libraries of the USGS field offices whose addresses are listed in this introduction. The libraries may be queried concerning the availability of specific documents and the possible utilization of local copying services, such as color reproduction.

Avail: HMSO. Publications of Her Majesty's Stationery Office are sold in the U.S. by Pendragon House, Inc. (PHI), Redwood City, California. The U.S. price (including a service and mailing charge) is given, or a conversion table may be obtained from PHI.

Avail: BLL (formerly NLL): British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. Photocopies available from this organization at the price shown. (If none is given, inquiry should be addressed to the BLL.)

Avail: Fachinformationszentrum, Karlsruhe. Sold by the Fachinformationszentrum Energie, Physik, Mathematik GMBH, Eggenstein Leopoldshafen, Federal Republic of Germany, at the price shown in deutschmarks (DM).

Avail: Issuing Activity, or Corporate Author, or no indication of availability. Inquiries as to the availability of these documents should be addressed to the organization shown in the citation as the corporate author of the document.

Avail: U.S. Patent and Trademark Office. Sold by Commissioner of Patents and Trademarks, U.S. Patent and Trademark Office, at the standard price of 50 cents each, postage free.

Other availabilities: If the publication is available from a source other than the above, the publisher and his address will be displayed entirely on the availability line or in combination with the corporate author line.

#### **SUBSCRIPTION AVAILABILITY**

This publication is available on subscription from the National Technical Information Service (NTIS). The annual subscription rate for the monthly supplements, excluding the annual cumulative index, is \$65.00 domestic; \$130.00 foreign. All questions relating to the subscriptions should be referred to NTIS.

## ADDRESSES OF ORGANIZATIONS

American Institute of Aeronautics  
and Astronautics  
Technical Information Service  
555 West 57th Street, 12th Floor  
New York, New York 10019

British Library Lending Division,  
Boston Spa, Wetherby, Yorkshire,  
England

Commissioner of Patents and  
Trademarks  
U.S. Patent and Trademark Office  
Washington, D.C. 20231

Department of Energy  
Technical Information Center  
P.O. Box 62  
Oak Ridge, Tennessee 37830

ESA-Information Retrieval Service  
ESRIN  
Via Galileo Galilei  
00044 Frascati (Rome) Italy

Fachinformationszentrum Energie, Physik,  
Mathematik GMBH  
7514 Eggenstein Leopoldshafen  
Federal Republic of Germany

Her Majesty's Stationery Office  
P.O. Box 569, S.E. 1  
London, England

NASA Scientific and Technical Information  
Facility  
P.O. Box 8757  
B. W. I. Airport, Maryland 21240

National Aeronautics and Space  
Administration  
Scientific and Technical Information  
Branch (NST-41)  
Washington, D.C. 20546

National Technical Information Service  
5285 Port Royal Road  
Springfield, Virginia 22161

Pendragon House, Inc.  
899 Broadway Avenue  
Redwood City, California 94063

Superintendent of Documents  
U.S. Government Printing Office  
Washington, D.C. 20402

University Microfilms  
A Xerox Company  
300 North Zeeb Road  
Ann Arbor, Michigan 48106

University Microfilms, Ltd.  
Tylers Green  
London, England

U.S. Geological Survey  
1033 General Services Administration  
Building  
Washington, D.C. 20242

U.S. Geological Survey  
601 E. Cedar Avenue  
Flagstaff, Arizona 86002

U.S. Geological Survey  
345 Middlefield Road  
Menlo Park, California 94025

U.S. Geological Survey  
Bldg. 25, Denver Federal Center  
Denver, Colorado 80225



# NTIS PRICE SCHEDULES

## Schedule A STANDARD PAPER COPY PRICE SCHEDULE

(Effective January 1, 1981)

Price Code	Page Range	North American Price	Foreign Price
A01	Microfiche	\$ 3.50	\$ 7.00
A02	001-025	5.00	10.00
A03	026-050	6.50	13.00
A04	051-075	8.00	16.00
A05	076-100	9.50	19.00
A06	101-125	11.00	22.00
A07	126-150	12.50	25.00
A08	151-175	14.00	28.00
A09	176-200	15.50	31.00
A10	201-225	17.00	34.00
A11	226-250	18.50	37.00
A12	251-275	20.00	40.00
A13	276-300	21.50	43.00
A14	301-325	23.00	46.00
A15	326-350	24.50	49.00
A16	351-375	26.00	52.00
A17	376-400	27.50	55.00
A18	401-425	29.00	58.00
A19	426-450	30.50	61.00
A20	451-475	32.00	64.00
A21	476-500	33.50	67.00
A22	501-525	35.00	70.00
A23	526-550	36.50	73.00
A24	551-575	38.00	76.00
A25	576-600	39.50	79.00
	601-up	-- 1/	-- 2/

A99 - Write for quote

1/ Add \$1.50 for each additional 25 page increment or portion thereof for 601 pages up.

2/ Add \$3.00 for each additional 25 page increment or portion thereof for 601 pages and more.

## Schedule E EXCEPTION PRICE SCHEDULE

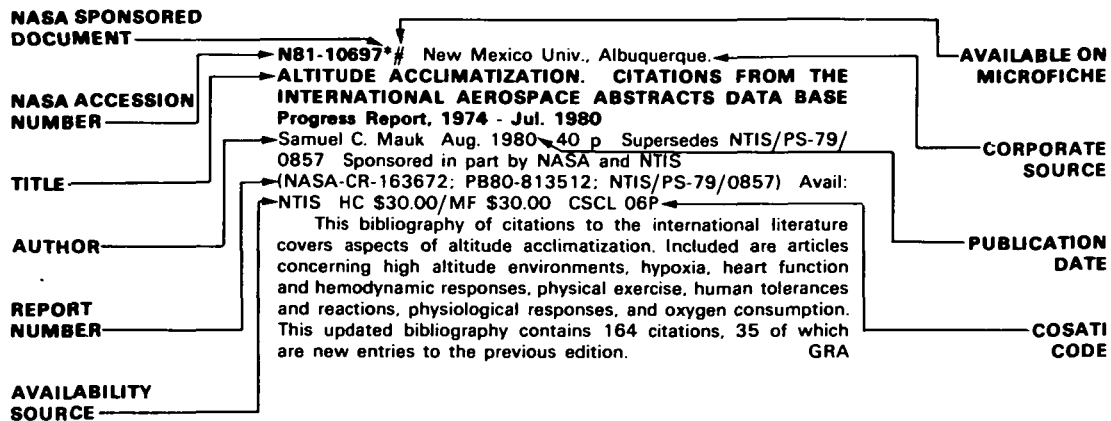
Paper Copy & Microfiche

Price Code	North American Price	Foreign Price
E01	\$ 5.50	\$ 11.50
E02	6.50	13.50
E03	8.50	17.50
E04	10.50	21.50
E05	12.50	25.50
E06	14.50	29.50
E07	16.50	33.50
E08	18.50	37.50
E09	20.50	41.50
E10	22.50	45.50
E11	24.50	49.50
E12	27.50	55.50
E13	30.50	61.50
E14	33.50	67.50
E15	36.50	73.50
E16	39.50	79.50
E17	42.50	85.50
E18	45.50	91.50
E19	50.50	100.50
E20	60.50	121.50
E99 - Write for quote		
N01	28.00	40.00

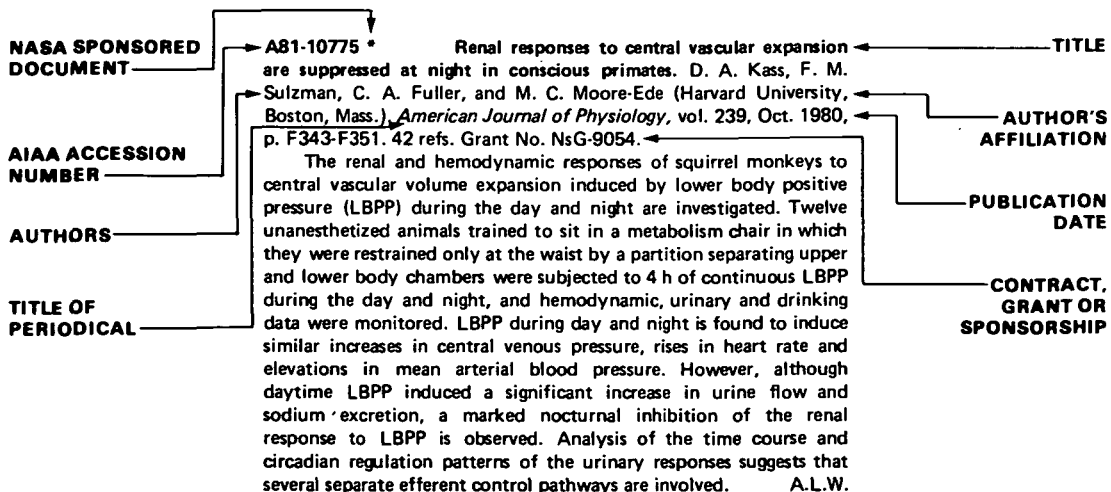
# TABLE OF CONTENTS

	Page
IAA ENTRIES (A81-10000) .....	199
STAR ENTRIES (N81-10000) .....	207
Subject Index .....	I-1
Personal Author Index .....	I-17

## TYPICAL CITATION AND ABSTRACT FROM STAR



## TYPICAL CITATION AND ABSTRACT FROM IAA



# AEROSPACE MEDICINE AND BIOLOGY

*A Continuing Bibliography (Suppl. 226)*

DECEMBER 1981

## IAA ENTRIES

**A81-44037**      **A closed ecosystem for space colonies.** I. R. Richards. *British Interplanetary Society, Journal (Interstellar Studies)*, vol. 34, Sept. 1981, p. 392-399. 15 refs.

The development of closed ecosystems is likely to form one stage in the evolution of methods for providing food in space. An example of such an ecosystem is described here in sufficient detail to assess general feasibility and material requirements. There are six component units devoted to the human population, plant production, animal production, waste processing, control and industrial products. Total material requirement, excluding structural elements, is 4272 kg per person while requirement for terrestrial carbon, hydrogen and nitrogen is 928 kg per person. Inclusion of animal production does not necessarily add to material requirements. The ecosystem provides daily 13.2 kJ dietary energy per person per kilogram of carbon, nitrogen and hydrogen. (Author)

**A81-44066 \***      **The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico.** D. J. Des Marais (NASA, Ames Research Center, Moffett Field, CA), J. M. Mitchell, W. G. Meinschein, and J. M. Hayes (Indiana University, Bloomington, IN). *Geochimica et Cosmochimica Acta*, vol. 44, Dec. 1980, p. 2075-2086. 42 refs. Grant No. NGR-15-003-118.

The structures and C-13 contents of individual hydrocarbons extracted from bat guano found in the Carlsbad region of New Mexico are analyzed in order to elucidate details of the carbon flow in the plant-insect-bat ecosystem. Carbon isotopic analyses indicate that equivalent numbers of plants with C3 and C4 photosynthetic pathways occupy the feeding area of the bats, which supports alfalfa and cotton as well as native plants. The molecular composition of the guano is consistent with an origin in two distinct populations of insects with different feeding habits, one of which may graze predominantly on crops. It is also pointed out that isotopic analyses of more ancient guano deposits may be useful in characterizing prevalent vegetation and climate of earlier periods. A.L.W.

**A81-44137 #**      **Derivation of human pilot control laws based on literal interpretation of pilot training literature.** R. K. Heffley and T. M. Schulman (Systems Technology, Inc., Mountain View, CA). In: Guidance and Control Conference, Albuquerque, NM, August 19-21, 1981, Collection of Technical Papers. New York, American Institute of Aeronautics and Astronautics, Inc., 1981, p. 513-519. 7 refs. (AIAA 81-1822)

Pilot training literature can be readily exploited in constructing and quantifying human pilot control laws. In turn these laws provide a realistic pilot-vehicle loop structure context which lends itself to design and analysis applications. This paper describes the procedure for interpreting pilot training instructions and gives several examples of resulting pilot-vehicle models and their uses. These examples include heading changes, altitude changes, and the landing of a fixed-wing airplane. In each case the pilot control laws are interpreted in terms of necessary essential pilot cues and the dependence upon airframe or control dynamics. As a result the derived human pilot control laws provide a helpful bridge between the aircraft and its operating environment. (Author)

**A81-44175 #**      **Is the central control of temperature stability the paradigm of homeostasis /Discussion of theories and evidence/**

(Iavlivaetsia li tsentral'nyi kontrol' postoianstva temperatury prime-rom gomeostazisa /Obsuzhdenie teorii i dokazatel'stv/). J. Bligh (Alaska, University, Fairbanks, AK). *Fiziologicheskii Zhurnal SSSR*, vol. 67, July 1981, p. 1068-1078. 18 refs. In Russian.

Consideration is given to the question of whether there exists a connection between peripheral heat and cold receptors and central sensors which leads to the production of error signals of a complex control variable, or whether the peripheral signals must be regarded as modulators of sensor-effector thermoregulatory pathways. Current understandings of the thermoregulatory systems of mammals are reviewed, and interactions of signals from central and peripheral thermoreceptors are discussed. A neuronal model of core thermoregulation is proposed which treats receptor outputs as modulational influences on the pathways from fundamental sensors to the effectors and allows core temperature to be regarded as the control variable, as in other systems of homeostasis. An analog circuit model of the proposed thermoregulatory system is also presented which may be used for experimental studies. A.L.W.

**A81-44270**      **Exterspecific component of the motion parallax field.** J. J. Koenderink and A. J. van Doorn (Utrecht, Rijksuniversiteit, Utrecht, Netherlands). *Optical Society of America, Journal*, vol. 71, Aug. 1981, p. 953-957. 10 refs.

For the egocentric orientation of observers moving with respect to a plane (e.g., pilots and automobile drivers), the movement parallax field provides the main cue. The parallax field is split into a lamellar and a solenoidal part, and it is shown that the solenoidal part is purely propriospecific. For instance, it can be shown that this component can be completely canceled by an appropriate eye movement. Thus all exterospecific information is contained in the lamellar part, and this part is completely determined by the divergence of the parallax field. Thus the measure of expansion of the visual field as a function of direction of gaze is sufficient to provide all information available for egocentric orientation. It is further shown that the widely used focus of expansion, as introduced by Gibson, is not invariant against eye movements and does not (in general) correspond to extrema of the divergence. (Author)

**A81-44271**      **Motion sensitivity measured by a psychophysical linearizing technique.** D. Regan and K. I. Beverley (Dalhousie University, Halifax, Canada). *Optical Society of America, Journal*, vol. 71, Aug. 1981, p. 958-965. 15 refs. Natural Sciences and Engineering Research Council of Canada Grant No. A-0323; Grant No. AF-AFOSR-78-3711.

A description is given of a psychophysical technique for measuring the attenuation characteristic of the first stage of a model considered by Regan and Beverley (1980). Using this technique, a comparison has been conducted of the attenuation characteristic for this first stage and for the psychophysical channel as a whole. It is concluded that the first stage seems to be approximately linear with respect to both stimulus speed and stimulus frequency. On the basis of psychophysical experiments, it is proposed that each of the changing size channels can be modeled as a sequence of linear and nonlinear stages. In brief, the first stage of the considered model consists of a pair of motion filters driven from different regions of the retina. It is supposed that the retinal image of an object is located so that opposite edges drive the two motion filters. G.R.

**A81-44386 \***      **Life sciences flight experiments program - Overview.** W. E. Berry (NASA, Ames Research Center, Life Sciences Flight Experiments Projects Office, Moffett Field, CA) and C. C. Dant (Management and Technical Services Co., Moffett Field, CA). In: Material and process applications - Land, sea, air, space; Proceedings of the Twenty-sixth National Symposium and Exhibi-

tion, Los Angeles, CA, April 28-30, 1981.

Azusa, CA, Society for the Advancement of Material and Process Engineering, 1981, p. 728-737.

The considered LSFE program focuses on Spacelab life sciences missions planned for the 1984-1985 time frame. Life Sciences Spacelab payloads, launched at approximately 18-months intervals, will enable scientists to test hypotheses from such disciplines as vestibular physiology, developmental biology, biochemistry, cell biology, plant physiology, and a variety of other life sciences. An overview is presented of the LSFE program that will take advantage of the unique opportunities for biological experimentation possible on Spacelab. Program structure, schedules, and status are considered along with questions of program selection, and the science investigator working groups. A description is presented of the life sciences laboratory equipment program, taking into account the general purpose work station, the research animal holding facility, and the plant growth unit. G.R.

**A81-44475 # The instruction of student pilots in breathing and speaking at excess oxygen pressures (Obuchenie kursantov-letchikov dykhaniiu i rechi pri izbytochnom davlenii kisloroda).** V. S. Lozinskii and Iu. K. Sitnichenko. *Voenno-Meditsinskii Zhurnal*, June 1981, p. 40, 41. In Russian.

Procedures used in a program for the instruction of student pilots in the techniques of breathing and speaking under conditions of excess oxygen pressures such as those encountered during high-altitude flight are discussed. The program included a preliminary stage of psychophysiological preparation in which students were informed about the use of the oxygen-breathing trainer, the characteristics of breathing and speaking at excess pressures, the difficulties that may arise in the course of training, means of avoiding them, and the sensations to be encountered. Students then underwent training in an oxygen simulator at excess oxygen pressures of 800, 1200 and 1600 mm H<sub>2</sub>O while dressed in pressure suits and helmets, and subject speech characteristics, facial appearance, complaints, heart rate, breathing and electrocardiogram dynamics were monitored at each stage. The importance of electrocardiography to monitor changes in heart function with increased excess pressures is pointed out together with the requirement for close medical monitoring in such situations. A.L.W.

**A81-44651 Touch-sensing technology - A review.** L. D. Harmon (Case Western Reserve University, Cleveland, OH). *Society of Manufacturing Engineers, Paper MSR80-03*, 1980. 58 p. 160 refs. Research supported by the Lord Corp.

This is a survey and assessment of tactile sensing and feedback devices and systems for robots. Special emphasis is placed on touch sensing as it relates to industrial manipulators. The state-of-the-art in parameters (e.g., force, torque, compliance, slip), in transducers (e.g., conductive and semiconductive materials and arrays, noncontact sensing), and in tactile pattern recognition is surveyed. Present application areas in manipulation and in prosthetics are outlined. The review concludes with consideration of outstanding problems, new opportunities, and emergent technology. (Author)

**A81-44800 Cardiac arrhythmias in space - Role of vagotonia.** G. Leguay and A. Seigneux (Hôpital d'Instruction des Armées Dominique Larrey, Versailles, France). (*International Astronautical Federation, Congress, 20th, Munich, West Germany, Sept. 17-22, 1979, Paper.*) *Acta Astronautica*, vol. 8, July 1981, p. 795-801. 7 refs.

Cardiac arrhythmia in astronauts in space environments, which includes ventricular or supra-ventricular extrasystoles, nodal arrhythmia, and auriculo-ventricular conduction disorders, is discussed. Several etiopathogenic hypotheses are presented, such as underlying heart disease, potassium deficiency, and the role of catecholamines. Special attention is given to the role of hypervagotony, which can be a result of weightlessness and of fluid shifts, and which can induce intermittent atrial flutter. Possible therapies for various atrial, nodal, and ventricular disorders are discussed, with special attention given to vagal atrial arrhythmias. K.S.

**A81-44856 Comparison of survival times under rising and fixed temperature conditions.** C. J. Hilado and P. A. Huttlinger (Product Safety Corp., Sunnyvale, CA). *Journal of Combustion Toxicology*, vol. 8, May 1981, p. 96-107. 26 refs.

A rising temperature program appears to be a reasonably precise means of integrating the effects of successive fixed temperatures on animal survival times upon exposure to off-gases from materials under closed-system conditions. This concept appears to be most valid for materials from which carbon monoxide appears to be the principal toxic off-gas. (Author)

**A81-44857 Experimental intoxications by PVC thermal degradation products - Study of the respiratory tract lesions.** C. Nogues, C. Fouet, P. Picart, and J. M. Jouany (Centre d'Etudes et de Recherches de Médecine Aéropatiale, Laboratoire Central de Biologie Aéropatiale, Paris, France). *Journal of Combustion Toxicology*, vol. 8, May 1981, p. 108-120. 11 refs. Translation. Research supported by the Direction des Recherches, Etudes et Techniques.

A study has been carried out on the toxicity of pyrolysis products of PVC. The first results obtained after pyrolysis of polyvinyl-chloride (PVC) show necrotic lesions of the respiratory tract associated with a pulmonary edema in the animals. This edema was accompanied by a capillary protein leakage. This analysis is based on scanning and transmission ultrastructural observations. (Author)

**A81-44859 Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure.** J. G. Gaume, R. C. Reibold, and H. H. Spieth (Douglas Aircraft Co., Long Beach, CA). *Journal of Combustion Toxicology*, vol. 8, May 1981, p. 125-134. 5 refs.

A description is presented of a combined system in which the ECG provides cardiac data directly from the rat and the Time to Incapacitation (Ti) system gives an indication as to the collapse of the rat. Following collapse, a special a.c. circuit of the Ti sensing system is used to obtain respiration to determine respiratory arrest and the Time to Death. At the present time the combined system has been used on a repetitive basis to study the relationship between the occurrence of a significant cardiac arrhythmia (Ca) and Ti at CO concentrations near 1.4% in air (range 1.125 to 1.46%). In evaluation of the obtained results, it appears to make little difference whether the ECG or the Ti system is used because of the two endpoints occur so close together, within the margin of error for either one. If possible it would be better to use the combined system because more information can be obtained from the use of the two approaches together in the same unit, and where one might fail, the other may provide the necessary information. G.R.

**A81-44890 # Physiological mechanisms for the adaptation of the respiratory regulation system to acute high-altitude hypoxia (Fiziologicheskie mekhanizmy prispobleniia sistemy regulatsii dykhanii k kratkovremennomu vozdeistviu vysokogornoj gipoksii).** M. M. Mirakhimov, T. F. Kal'ko, and I. S. Breslav (Ministerstvo Zdravookhraneniia Kirgizskoi SSR, Nauchno-Issledovatel'skii Institut Fiziologii, Frunze, Kirgiz SSR; Akademiia Nauk SSSR, Institut Fiziologii, Leningrad, USSR). *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 623-628. 35 refs. In Russian.

**A81-44891 # The relative characteristics of continuous and intermittent adaptation to high temperatures (Sravnitel'naia kharakteristika gladkoi i drobnai adaptatsii k usloviim vysokoi temperatury).** A. T. Mar'ianovich (Voenno-Meditsinskaiia Akademiia, Leningrad, USSR). *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 642-648. 16 refs. In Russian.

The relative effectiveness of intermittent exposures to a high-temperature environment and constant exposure to heat of lower intensity in evoking human adaptation to high temperatures are investigated. Groups of subjects were exposed to either a temperature of 36-49 C three hours a day for up to eight consecutive days or temperatures from 60 to 70 C for three consecutive 10 to 20-min periods separated by intervals of room temperature during bicycle ergometer exercise for up to five days. Measurements of heart rate, respiratory rate, oxygen uptake, CO<sub>2</sub> production, rectal temperature, and sweat rate performed during exercise at 49 and 24 C reveal those persons exposed to intermittent periods of intense heat to exhibit a greater heat tolerance than those exposed to less intense heat for longer periods, with greater differences apparent under extreme test conditions. A.L.W.

**A81-44892 #** Functional characteristics of cardiovascular system response to head-pelvis overloads (Funktsional'nye osobennosti reaktsii serdechno-sosudistoi sistemy na vozdeistvie peregruzok 'golova-taz'). E. B. Shul'zhenko, I. F. Vil'-Vil'iams, T. N. Krupina, Kh. Kh. Iarullin, and N. P. Artamonova. *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 649-653. 6 refs. In Russian.

The functional condition of the cardiovascular system of older persons exposed to accelerations in the head-pelvis direction is investigated under normal conditions and following weightlessness simulation. EKG recordings and measurements of systematic and systolic arterial pressures were obtained in subjects aged 40 to 55 years during longitudinal acceleration loads of 3 G in a centrifuge of radius 7.25 m under normal conditions, and following a seven-day period of antiorthostatic hypokinesia at a head-down tilt of 8 deg. Although no changes in the response of regional blood flow to acceleration stresses were observed following the antiorthostatic period, a tendency towards sinusoidal tachycardia was found in all subjects during centrifugation following weightlessness simulation. In initially hypertensive subjects, a more marked reaction to centrifugation stresses is encountered during the first few exposures than in normotensive subjects, which is attributed to emotional factors.

A.L.W.

**A81-44893 #** The regulation of cardiovascular system activity during transient thermal stress (Regulatsiia deiatel'nosti serdechno-sosudistoi sistemy pri kratkovremennoi teplovoi nagruzke). N. I. Sapova. *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 654-659. 15 refs. In Russian.

The regulation of blood circulation during short-duration exposure to high-temperature environments is investigated. Experimental subjects were exposed to an air temperature of 43 C for 2 hours, during which they lay horizontally on a tilt table for 1 hour, then were subject to passive and active orthostatic tests, in which they assumed a vertical position, followed by clinostatic tests, where they resumed a horizontal position. Measurements performed included the remote determination of arterial blood pressure, electrocardiography, intervalcardiography, rheoencephalography and rheovasography. The thermal stimulus is found to lead to significant changes in blood circulation parameters corresponding both to adaptive and deadaptive (pathological) mechanisms. A precollapsible state is observed in a significant number of subjects following the passive orthostatic tests, associated with a substantial decrease in vessel tonus in the lower extremities and a reduction in venous return to the heart. A set of parameters is proposed for the prediction of human heat tolerances based on measurements of the variability and correlation of physiological indices as well as their mean values.

A.L.W.

**A81-44894 #** The influence of arm work in the antiorthostatic position on indicators of left ventricle activity (Vliianie raboty rukami v antiortostaticheskom polozenii na pokazateli deiatel'nosti levogo zheludochka serdtsa). V. E. Katkov, V. V. Chestukhin, V. M. Mikhailov, V. A. Iakoveleva, O. Kh. Zybin, and N. I. Kauricheva. *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 676-681. 21 refs. In Russian.

**A81-44895 #** The influence of lower body negative pressure tests on peripheral hemodynamics indicators (Vliianie funktsional'noi proby s vozdeistviem otritsatel'nogo davleniia na nizhniiu polovinu tela na pokazateli perifericheskoi gemodinamiki). T. A. Kabesheva and N. E. Panferova. *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 682-686. 23 refs. In Russian.

Changes in volume blood flow rate, venous bed capacity and indicators of filtration-reabsorption relations in the crural and forearm regions under stepwise increasing levels of lower body negative pressure (LBNP) are studied. Peripheral blood flow was monitored by plethysmography in 10 subjects exposed to LBNP at discrete levels from 25 to 50 mm Hg. The most marked shifts in hemodynamic parameters are found during the initial stages of LBNP, including increases in the venous volume of the lower extremities, elevations of volume blood flow rate in the crural regions and an enhancement of fluid filtration in intertissue space. As LBNP continued, the volume blood flow rate is found to decrease and processes of fluid filtration and reabsorption to equalize. In the forearm regions, LBNP is observed to lead to a reduction in venous volume and volume blood flow rate.

A.L.W.

**A81-44896 #** The functional condition of the adrenal cortex and kidneys of a healthy man during prolonged antiorthostatic hypokinesia (Funktsional'noe sostoianie kory nadpochechnikov i pochek zdorovogo cheloveka pri dlitel'noi antiortostaticheskoi gipokinezii). V. B. Noskov. *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 700-704. 16 refs. In Russian.

**A81-44897 #** The regulation of calcium exchange under conditions of prolonged antiorthostatic hypokinesia (Regulatsiia obmena kal'tsiia v usloviakh dlitel'noi antiortostaticheskoi gipokinezii). A. I. Grigor'ev, B. V. Morukov, B. R. Dorokhova, and L. A. Rustam'ian. *Fiziologiya Cheloveka*, vol. 7, July-Aug. 1981, p. 705-709. 20 refs. In Russian.

Characteristics of the regulation of calcium exchange in healthy persons exposed to 182 days of antiorthostatic hypokinesia are investigated. Total calcium concentrations, ionized calcium activities and parathyroid hormone concentrations in blood serum were determined, before, during, and up to 15 days after a 182-day period of strict bed rest at a head-down tilt of 4 deg, and tests of blood urine responses to a calcium lactate stress were performed to study the role of the kidneys. An increase in calcium ion activity is observed during the period of hypokinesia, while total calcium concentrations changed to a lesser degree. Plasma parathyroid hormone levels are found to significantly exceed background levels during hypokinesia and in the recovery period immediately following. Finally, the increase in calcium excretion in the urine during prolonged limitations of muscular activity is found to be connected with both an enhancement of calcium filtration and a decrease in its reabsorption in the kidneys, possibly due to changes in hormonal regulation.

A.L.W.

**A81-45176 \*** Exercise training hypotension - Implications for plasma volume, renin, and vasopressin. J. E. Greenleaf, D. Sciaraffa, E. Shvartz, L. C. Keil, and P. J. Brock (NASA, Ames Research Center, Biomedical Research Div., Moffett Field, CA). *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology*, vol. 51, Aug. 1981, p. 298-305. 30 refs.

The relation of changes in plasma volume, plasma renin activity and arginine vasopressin to changes in resting blood pressure during exercise training is investigated. Resting supine, sitting, and standing systolic and fifth-phase diastolic blood pressures were measured in ten men before and after an eight-day training period on a cycle ergometer in either a hot (39.8 C) or cool (23.8 C) environment, and compared with plasma volume, renin and vasopressin levels, heart rates, maximal oxygen uptakes, rectal temperatures and sweat rates. Following acclimatization, resting supine and sitting diastolic pressures are observed to decrease by 6 and 9 mm Hg, respectively, while no significant changes are found in the diastolic pressures of the control group or the systolic pressures of either group. Resting plasma volume is found to increase by 12.2% in the controls and by 17.6% after acclimatization following the exercise training. Results suggest that the resting hypotension produced is not attributable to changes in resting plasma volume, renin or vasopressin, although heat acclimatization, which leads to large decreases in plasma volume and increases in vasopressin and renin activity, may be useful in the treatment of hypertension.

A.L.W.

**A81-45177** Respiratory muscle fatigue during cardiogenic shock. M. Aubier, T. Trippebach (McGill University Clinic, Montreal, Canada), and C. Roussos. *Journal of Applied Physiology: Respiratory, Environmental and Exercise Physiology*, vol. 51, Aug. 1981, p. 499-508. 34 refs. Research supported by the Medical Research Council of Canada.

The occurrence and mechanisms of respiratory failure due to respiratory muscle fatigue during cardiogenic shock are investigated. Circulatory and respiratory parameters, respiratory muscle electrical activity, efferent phrenic activity and metabolic parameters were measured in 13 dogs breathing spontaneously and seven dogs artificially ventilated and paralyzed prior to and following the induction of cardiogenic shock. The spontaneously breathing animals died on the average 140 min after the onset of cardiogenic shock, due to respiratory arrest, while the artificially ventilated dogs were still alive 3 h later. Expiratory minute ventilation was observed to gradually increase for about 1 h following the induction of shock, then decrease gradually until the death of the animals. The electrical activities of the diaphragm and intercostal muscles and the phrenic



nerve increased continuously until death, while transdiaphragmatic pressure and tracheal occlusion pressure 0.3 sec after the onset of inspiration followed the pattern of ventilation. It is concluded that the respiratory failure was due to an impairment of respiratory muscle contraction, and the possible therapeutic implications of artificial ventilation are pointed out. A.L.W.

**A81-45495 \*** Amino acids of the Murchison meteorite. I - Six carbon acyclic primary alpha-amino alkanic acids. J. R. Cronin, W. E. Gandy, and S. Pizzarello (Arizona State University, Tempe, AZ). *Journal of Molecular Evolution*, vol. 17, Aug. 1981, p. 265-272. 18 refs. Grant No. NSG-7255.

Six of the seven chain isomers of six-carbon acyclic primary alpha-amino alkanic acids (leucine isomers) have been either identified or confirmed in hot-water extracts of the Murchison meteorite using combined gas chromatography-mass spectrometry (GC-MS) and ion exchange chromatography. 2-Amino-2-ethylbutyric acid, 2-amino-2,3-dimethylbutyric acid, pseudoleucine, and 2-methylnorvaline were positively identified by GC-MS. These amino acids have not been previously reported to occur in natural materials and may be uniquely meteoritic in origin. The presence of leucine and isoleucine (including the diastereoisomer, alloisoleucine) was confirmed. Peaks corresponding to norleucine were seen by ion-exchange and gas chromatography but characteristic mass spectra were not obtained. The alpha-branched chain isomers in this series are quantitatively the most significant. These results are compared with literature data on amino acid synthesis by electrical discharge and Fischer-Tropsch-type catalysis. Neither model system produces an amino acid suite that is completely comparable to that found in the Murchison meteorite. (Author)

**A81-45496 \*** Reasons for the occurrence of the twenty coded protein amino acids. A. L. Weber (Salk Institute for Biological Studies, San Diego, CA) and S. L. Miller (California, University, La Jolla, CA). *Journal of Molecular Evolution*, vol. 17, Aug. 1981, p. 273-284. 92 refs. Grants No. NSG-7627; No. NAGW-20.

Factors involved in the selection of the 20 protein L-alpha-amino acids during chemical evolution and the early stages of Darwinian evolution are discussed. The selection is considered on the basis of the availability in the primitive ocean, function in proteins, the stability of the amino acid and its peptides, stability to racemization, and stability on the transfer RNA. It is concluded that aspartic acid, glutamic acid, arginine, lysine, serine and possibly threonine are the best choices for acidic, basic and hydroxy amino acids. The hydrophobic amino acids are reasonable choices, except for the puzzling absences of alpha-amino-n-butyric acid, norvaline and norleucine. The choices of the sulfur and aromatic amino acids seem reasonable, but are not compelling. Asparagine and glutamine are apparently not primitive. If life were to arise on another planet, it would be expected that the catalysts would be poly-alpha-amino acids and that about 75% of the amino acids would be the same as on the earth. (Author)

**A81-45497 \*** Cyanamide mediated syntheses of peptides containing histidine and hydrophobic amino acids. J. R. Hawker, Jr. and J. Oro (Houston, University, Houston, TX). *Journal of Molecular Evolution*, vol. 17, Aug. 1981, p. 285-294. 36 refs. Grant No. NGR-44-005-002.

**A81-45498 \*** Synthesis of oligoguanylates on oligocytidylylate templates. H. Fakhrai, J. H. G. van Roode, and L. E. Orgel (Salk Institute for Biological Studies, San Diego, CA). *Journal of Molecular Evolution*, vol. 17, Aug. 1981, p. 295-302. 16 refs. Grant No. NGR-05-067-001.

The influence of template length in the self-condensation of guanosine 5'-phosphorimidazole in the presence of oligocytidylylate templates is investigated. Reactions were carried out with cyclic cytidine 2',3'-phosphate, oligo- or polyC, and radioactively labeled guanosine 5'-phosphorimidazole in the presence of Zn(+2) or Pb(+2) catalyst; product yields were determined by paper chromatography, thin-layer chromatography, and high-performance liquid chromatography. In the absence of a catalytic metal or in the presence of Pb(+2), a significant template effect is observed starting with the cytidine dimer and increasing in yield up to the hexamer template. Oligomers longer than the template are observed, and are predominantly 2'-5' linked in the presence of Pb(+2) and of mixed

linkages in the uncatalyzed reaction. With the zinc ion as the catalyst, the template effect is first observed with the pentamer and is maximal with the heptamer. Products are predominantly 3'-5', and only a small proportion of them are longer than the template. The importance of the demonstrated formation of molecules with up to 10 guanosine units from oligocytidines as short as the dimer on the primitive earth is noted. A.L.W.

**A81-45499 \*** Condensation of activated diguanylates on a Poly(C) template. R. Lohrmann, P. K. Bridson, and L. E. Orgel (Salk Institute for Biological Studies, San Diego, CA). *Journal of Molecular Evolution*, vol. 17, Aug. 1981, p. 303-306. 7 refs. Grants No. NIH-GM-13435; No. NGR-05-067-001.

The metal-ion catalysis of the oligomerization of activated diguanylate isomers on a polycytidylic acid template is studied in an investigation of possible early prebiotic polynucleotide replication mechanisms. The 5'-imidazolides of diguanylates linked 2' to 5' or 3' to 5' were reacted with polyC in a 1-methylimidazole or a 2,6-lutidine buffer in the presence of a Zn(+2) or a Pb(+2) catalyst, and reaction products were determined by paper chromatography, paper electrophoresis and liquid chromatography. In the lutidine buffer, the presence of both the Zn(+2) catalyst and the polyC template is found to result in the production of 3'-5' linked oligomers with up to 10 diguanylate units, and from diguanylates in the presence of the monomer. In the reactions conducted in the 1-methylimidazole buffer, the addition of Pb(+2) is found to lead to less marked increases in oligomerization in the presence of template, with approximately equal proportions of 2'-5' and 3'-5' oligomers formed from the 2'-5' substrate and mainly 3'-5' bonds from the 3'-5' linked dimer. A.L.W.

**A81-45664 #** Proceedings of NBS/Air Force ICAM workshop on robot interfaces. T. Wheatley, J. Albus, and R. Nagel (National Bureau of Standards, Washington, DC). *Society of Manufacturing Engineers, Paper MS80-06*, 1980. 55 p.

This paper describes the proceedings of a workshop on robot interfaces held at the National Bureau of Standards on June 4-6, 1980. Five possible areas for standardization of interfaces were discussed: the simple sensor interface between simple peripheral devices and a robot control system; the wrist interface, between the robot wrist and the end effector; the complex sensor interface that covers vision, complex touch, and other such sensors; the common robot control interface, providing robot independent trajectory descriptions; and future guidelines towards interfaces, covering database, offline programming, and system integration interfaces. The goal was to define the areas ready for current standards, and those for which standards would be considered an impediment to developing technologies. (Author)

**A81-45666** A three roll wrist robot. M. Frank. *Society of Manufacturing Engineers, Robots V International Meeting, Dearborn, MI, Oct. 28-30, 1980, Paper MS80-699*. 17 p.

It is noted that the flexibility of the robot arm and of its control determines the ability of a robot system to perform increasingly intricate tasks. The mechanical flexibility can be increased through a new and unique Three Roll Wrist. The wrist has three degrees of freedom, all coincident at one point, and is relatively small for its payload. A new robot arm employs this wrist, and as a result, the robot is shown to have, among other merits, an extremely large working volume, even when significant reorientation of the tool or part is required. The combination of this dextrous wrist and a computer control makes the robot highly suitable for many process applications. The enhanced capabilities of such a robot that come as a result of the forearm power train arrangement are discussed. Also, various applications that take advantage of this flexible robot are discussed. C.R.

**A81-45671 #** Space life sciences. R. von Baumgarten (Mainz, Universität, Mainz, West Germany). In: *Spacelab utilization: Materials research and technology in space; Seminar on Current Status, Würzburg, West Germany, September 16-18, 1980, Reports.*

Cologne, Deutsche Gesellschaft für Luft- und Raumfahrt, 1980, p. 37-43. In German. Bundesministerium für Forschung und Technologie Contract No. 01-QV-017-ZA/WF/WRK-275.

It is pointed out that in Europe the life sciences are comparatively little represented among the scientific disciplines for which

experiments have been conducted in a space environment. The reason for this situation is related to a lack of funding rather than a lack of applications. Life sciences comprise a number of different scientific disciplines, including the entire area of medicine, physiology, physiological chemistry, endocrinology, embryology, microbiology, zoology, botany, biochemistry, and psychology. The fact that life sciences concern themselves with 'life' provides them with special characteristics not found in other scientific disciplines. Even today the secret of life has not yet been solved. A number of the proposed German and U.S. space experiments are devoted to the study of a possible introduction of life, in an elementary form, from space. Other investigations in space are related to questions concerning the capability of man to live in space for prolonged periods of time. G.R.

**A81-46198 Latency of the perceived offset of brief target gratings.** G. M. Long and T. J. Gildea (Villanova University, Villanova, PA). *Vision Research*, vol. 21, no. 9, 1981, p. 1395-1399. 29 refs.

Observers adjusted a brief auditory probe to coincide with the phenomenal offset of a 50-msec target grating of varying spatial frequency. Increasing spatial frequency increased the chosen latency for the probe, while increasing grating luminance decreased the chosen latency for the probe. These results were interpreted in terms of the sensitivity of off-responses in the visual system to these stimulus variables. These latencies for off-responses were specifically distinguished from: visual persistence which is generally longer lasting and exhibits opposite relationships with the same stimulus variables. (Author)

**A81-46199 Perceived direction of motion under retinal image stabilization.** R. J. W. Mansfield (Harvard University, Cambridge, MA) and J. Nachmias. *Vision Research*, vol. 21, no. 9, 1981, p. 1423-1425. 10 refs. NSF Grant No. BNS-75-08437; Contract No. F44620-76-C-0109.

For slowly drifting gratings, contrast thresholds for discrimination of direction are higher than for detection. The effect is unaltered by retinal image stabilization, and consequently is unlikely to be caused by spontaneous eye movements. (Author)

**A81-46282 # An improved approach to predicting pilot rating behavior.** K. Tanaka (National Aerospace Laboratory, Tokyo, Japan). *Journal of Guidance and Control*, vol. 4, Sept.-Oct. 1981, p. 530-535. 8 refs.

An analytical method to predict pilot ratings is proposed and examined. The method is based upon the assumptions that the control task determines the crossover frequency at which the pilot should concentrate his control efforts, and that the degree of closed-loop stability and the corresponding pilot compensation required to attain the stability determine the pilot ratings. As an end result, a simple evaluation chart for single-input and single-output controlled elements is presented assuming that a rough estimate of the crossover frequency is given. The chart is in good accord with the actual pilot ratings. Considerations are also given on the merits and demerits of applying the method to researchers of aircraft handling qualities. (Author)

**A81-46324 Psychophysiological and other factors affecting human performance in accident prevention and investigation.** L. R. Klinefelter (EG & G Idaho, Inc., Idaho Falls, ID). *SAFE Journal*, vol. 11, Summer 1981, p. 6-11. 16 refs.

A literature search and review, conducted in the areas of accident investigation, revealed that psychophysiological factors exist not only in the aviation industry, but in industrial complexes where human operators are involved as well. There is little evidence, however, that industrial programs contain any type of training for coping with these factors or for reducing accidents. The review showed that selection of personnel, training of personnel, and the utilization of proper procedures were less than adequate in having a direct effect on human performance. The review also found that deficiencies in engineering design may reduce human performance, causing or increasing errors. In order to reduce the human error potential and minimize accidents, it was suggested that management provide an awareness training program, operational aids, operation simulators, feedback of information, screening of personnel for

high-risk assignments, and formal accident/investigation training. Some researchers, however, felt that neither design improvement, training, motivation, procedures, rest, nor simulation would reduce all residual errors. J.F.

**A81-46451 Augmented feedback in adaptive motor skill training.** D. O. Cote (U.S. Army, Aeromedical Research Laboratory, Fort Rucker, AL), B. H. Williges, and R. C. Williges (Virginia Polytechnic Institute and State University, Blacksburg, VA). *Human Factors*, vol. 23, Aug. 1981, p. 505-508. USAF-sponsored research.

Two studies are presented in which a two-dimensional pursuit tracking task was used to teach a complex perceptual motor skill. The primary emphasis in these studies was to test the need for augmented task difficulty feedback in adaptive training situations where changes in task difficulty rather than performance improvements represent training progress. Augmented feedback was provided either auditorially or visually or both. However, no reliable effects due to feedback were found in either training time-to-criterion or transfer tracking accuracy. In both studies students trained adaptively performed more accurately in transfer. (Author)

**A81-46453 \* Modeling the human controller in environments that include continuous and discrete tasks.** T. Govindaraj (Purdue University, West Lafayette, IN) and W. B. Rouse (Illinois, University, Urbana, IL). *IEEE Transactions on Systems, Man, and Cybernetics*, vol. SMC-11, June 1981, p. 410-417. 17 refs. Grant No. NSG-2119.

In complex environments where the human operator is a supervisor, he must allocate his attention between different kinds of tasks for satisfactory overall performance. When a portion of the future reference trajectory for a continuous control task is available for preview, scheduling various other discrete activities is possible. A model has been developed for this situation using dynamic programming to solve an optimal control problem. An experiment was conducted where subjects controlled an airplane symbol over a map, shown a fixed distance into the future. Discrete tasks were introduced as data entry tasks. Results showed that the model compared favorably with experimental results. (Author)

**A81-46456 \* # Aircraft control-display analysis and design using the optimal control model of the human pilot.** R. A. Hess (NASA, Ames Research Center, Aircraft Guidance and Navigation Branch, Moffett Field, CA). (*Institute of Electrical and Electronics Engineers, International Conference on Cybernetics and Society, Cambridge, MA, Oct. 8-10, 1980.*) *IEEE Transactions on Systems, Man, and Cybernetics*, vol. SMC-11, July 1981, p. 465-480. 23 refs.

The use of the optimal control model (OCM) of the human pilot as a design tool is discussed. A novel procedure for the assignment and selection of model parameters in the absence of experimental data is proposed. A technique for partitioning a weakly coupled, multiaxis task into approximate state-uncoupled, single-axis tasks is introduced. The resulting modeling technique is utilized in the design and analysis of an aircraft flight-director system. This flight-director design technique differs from previous related work using the OCM in that considerable effort is devoted to ensuring that the OCM-designed director exhibits the desirable frequency-domain characteristics associated with experimentally verified classical designs (e.g., K/s 'effective vehicle' characteristics, noninteracting controls). The implications of the technique in the design of automatic flight control systems which employ the human pilot as a performance assessor and failure detector are briefly discussed. (Author)

**A81-46523 Measurement of normal left atrial function with gated radionuclide angiography.** E. W. Bough, E. J. Gandsman, and R. S. Shulman (Miriam Hospital; Brown University, Providence, RI). *American Journal of Cardiology*, vol. 48, Sept. 1981, p. 473-478. 37 refs.

A method for measuring relative left atrial volume changes with gated radionuclide angiography is described. The method uses an approximate computer-generated functional image to locate the atrial region of interest. M mode echocardiographic measurements of left atrial and left ventricular distances from the chest were used to calculate a correction factor for the differential attenuation of atrial and ventricular photons. Background-corrected left atrial time-activity curves were obtained from normal subjects; they exhibited excellent temporal resolution and were used to identify and

quantitate the reservoir and contractile phases of left atrial volume changes. In 20 normal subjects, the mean value for left atrial fractional emptying was  $0.39 \pm 0.07$ . Expressed as fractions of the left ventricular stroke volume, mean values of the specific phases of atrial volume change were: (1) reservoir volume  $0.25 \pm 0.09$ ; (2) contractile volume  $0.29 \pm 0.10$ ; and (3) conduit volume  $0.46 \pm 0.12$ . J.F.

**A81-46524** Digital image processing of two dimensional echocardiograms - Identification of the endocardium. D. J. Skorton, C. A. McNary, J. S. Child, F. C. Newton, and F. M. Shah (California, University, U.S. Veterans Administration Wadsworth Medical Center, Los Angeles; Image Analytics, Inc., Tarzana, CA). *American Journal of Cardiology*, vol. 48, Sept. 1981, p. 479-486. 16 refs.

Digital computer image-processing techniques were applied to two-dimensional echocardiograms in an effort to improve the quality and accuracy of cardiac spatial measurements by enhancing endocardial recognition. The images were photographed from the two-dimensional echocardiographic monitor and digitized using an optical densitometer; image-processing algorithms were then applied to the digitized images. A linear correlation was found between M mode and computer-processed two-dimensional echocardiographic measurements of ventricular septal thickness ( $r = 0.88$ ); this correlation was superior to the correlation between M mode and unprocessed two-dimensional echocardiographic septal measurements ( $r = 0.55$ ). Correlations between M mode and processed or unprocessed two-dimensional echocardiographic measurements of left ventricular internal dimension were similar, but the slope of the regression line for the processed data more closely approximated the line of identity. Endocardial outlines derived with the use of digital image-processing techniques result in left ventricular measurements that correlate more closely with M mode measurements than do dimensions derived from unprocessed two dimensional echocardiography. J.F.

**A81-46525** Effect of aging on the electrocardiogram. S. Bachman, D. Sparrow, and L. K. Smith (U.S. Veterans Administration Outpatient Clinic; University Hospital, Boston, MA). *American Journal of Cardiology*, vol. 48, Sept. 1981, p. 513-516. 22 refs. Research supported by the U.S. Veterans Administration.

In order to examine cross sectional age differences and longitudinal changes in electrocardiographic patterns in the same individuals, serial recordings, obtained 10 years apart, were taken from 440 healthy male participants of the Normative Aging study. These participants ranged from 23 to 66 years old at their first examination. R and S wave amplitudes were smaller, and frontal plane axis measurements were shifted to the left in older men at the first examination. Longitudinal changes in these same variables were consistent with cross-sectional results. At the second examination the P-R and Q-T interval durations were longer, the QRS duration was shorter, and the T wave amplitude was smaller. The longitudinal rate of changes of S wave amplitude varied among age groups, decreasing more in younger men. These results, consistent with previously reported studies, identify electrocardiographic changes that can be expected with normal aging in a group of men considered to be apparently free from heart disease. J.F.

**A81-46516 #** Comparison of helicopter copilot workload while using three navigation systems during nap-of-the-earth flight. D. O. Cote, R. R. Simmons, and G. P. Krueger (U.S. Army, Aeromedical Research Laboratory, Fort Rucker, AL). In: American Helicopter Society, Annual Forum, 37th, New Orleans, LA, May 17-20, 1981, Proceedings. Washington, DC, American Helicopter Society, 1981, p. 153-162. 12 refs. Army-supported research.

Three different generic navigation systems were examined for their effects on copilot/navigator workload and performance during nap-of-the-earth (NOE) flight. The navigation systems examined were: (1) the conventional 1:50,000 scale topographic hand-held map, (2) a Doppler navigation system in conjunction with a hand-held map, and (3) a projected map system driven by Doppler signals in conjunction with a hand-held map. Eighteen subjects performed copilot/navigator duties in an Army JUH-1H utility helicopter flown by a pilot from the U.S. Army Aeromedical Research Laboratory (USAARL), Fort Rucker, Alabama. Data collected include copilot/navigator eye movements, pilot-copilot

communications and aircraft flight path. From the summary statistics, it appears that automatic navigation systems like the ones used in this project may reduce navigation workload and improve navigation performance. (Author)

**A81-46648 #** Detectability and annoyance of repetitive impulsive sounds. S. Fidell and R. Horonjeff (Bolt Beranek and Newman, Inc., Canoga Park, CA). In: American Helicopter Society, Annual Forum, 37th, New Orleans, LA, May 17-20, 1981, Proceedings. Washington, DC, American Helicopter Society, 1981, p. 515-521. 10 refs. Grant No. DAAG29-80-C-0057.

Psychoacoustic research on the audibility of trains of single cycle waveforms of varying fundamental frequency, repeated at varying repetition rates, revealed a sizeable difference in broadband signal to noise ratios needed to support constant detection performance. These differences were related to the bandwidth of the hypothetical first stage auditory filter through which people listen for signals occurring in background noise. Implications of these findings for design of helicopter rotor systems to minimize detectability and community annoyance are discussed in the context of the psychophysical Theory of Signal Detectability. (Author)

**A81-46791** Human adaptation mechanisms under high-latitude conditions (Mekhanizmy adaptatsii cheloveka v usloviakh vysokikh shirot). Edited by V. P. Kaznacheev. Moscow, Izdatel'stvo Meditsina, 1980. 200 p. In Russian.

Human adaptation to the climatic and geographic conditions of polar regions during the various seasons is examined on the basis of literature data and clinical and experimental observations. Following a review of the ecological factors characteristic of high latitudes, psychological and psychosomatic factors in polar adaptation are discussed, and neuroendocrine adaptation mechanisms under conditions of chronic stress are considered. Attention is also given to the responses of free radical lipid oxidation and oxygen metabolism, energy balance, vitamin, salt and trace element balances, biochemical indicators in the blood, nutritional regimes, circadian and annual rhythms and human pathology during adaption to polar regions, particularly the Asiatic extreme north. A.L.W.

**A81-46795 #** Biorhythms and work (Bioritmy i trud). K. M. Smirnov, A. O. Navakatikian, G. M. Gambashidze, N. V. Khovanov, O. V. Osipova, Sh. A. Khamzaev, V. I. Kudriavtseva, A. P. Kapshuk, A. I. Kovaleva, and A. V. Karpenko. Leningrad, Izdatel'stvo Nauka, 1980. 144 p. 205 refs. In Russian.

The rhythms of work are examined in the framework of the general theory of biorhythms, and also in the framework of the physiology of work and ergonomics. Low-frequency, high-frequency and circadian rhythms are discussed. B.J.

**A81-46796** Human ecological physiology. Part 2 - Human adaptation to various climato-geographical conditions (Ekologicheskaya fiziologiya cheloveka. Part 2 - Adaptatsiya cheloveka k razlichnym klimato-geograficheskim usloviyam). Edited by N. N. Vasilevskii. Leningrad, Izdatel'stvo Nauka, 1980. 552 p. In Russian.

Problems in the physiology of human adaptation to various climatic and geographical conditions are discussed. Particular attention is given to adaptations of human nervous, endocrine, cardiovascular, respiratory, thermoregulatory and metabolic systems to conditions at high latitudes, the characteristics of the cardiovascular, respiratory and blood systems at high altitudes, and human thermoregulatory, cardiovascular and nutritional functions in arid regions. Human adaptation to the conditions of the humid tropics is also considered, with attention given to thermoregulatory physiology, blood variations, respiration, nutrition, water and electrolyte balances, and work capacity. Human adaptation to the marine climate is also treated, along with general questions of the role of the endocrine system in adaptation mechanisms, the adaptation of biological rhythms, and the adaptation seen in children. A.L.W.

**A81-46825 #** Effect of X-rays on the bone marrow cells of white mice under conditions of hypoxia (Vliianie rentgenovskogo obлучeniia pri gipoksicheskoi gipoksii na kletki kostnogo mozga belykh myshei). M. A. Devidze (Tbilisskii Gosudarstvennyi Universitet, Tiflis, Georgian SSR). *Akademiia Nauk Gruzinskoi SSR, Soobshcheniia*, vol. 102, May 1981, p. 425-428. 5 refs. In Russian.

**A81-46923 #** Video terminals and informational interaction /Engineering and psychological aspects/ (Videoterminy i informatsionnoe vzaimodeistvie /Inzhenerno-psikhologicheskie aspekty/). V. F. Venda. Moscow, Izdatel'stvo Energiia, 1980. 200 p. 96 refs. In Russian.

Psychological factors in the design and operation of video terminals are examined, with attention given to the optimization of the man-machine interaction, in solving various operational, control, design, and research problems. Methods for the mathematical modeling of processes of informational man-machine interaction are described. Particular emphasis is placed on methods for improving the design of video terminals and their practical application in the development of automatic control systems. B.J.

**A81-46939** An in vitro system for assessing lung cell response to ozone. W. L. Hagar (City of St. Louis, Air Pollution Control, St. Louis, MO), W. E. Sweet (East-West Gateway Coordinating Council, St. Louis, MO), and F. Sweet (Washington University, St. Louis, MO). *Air Pollution Control Association, Journal*, vol. 31, Sept. 1981, p. 993-995. 14 refs.

It is noted that measurements of lung cell changes in animal studies have typically not been consistent because of the wide variety of cell types contained in the gross tissue and the observed variability in the response of the experimental animals. Cellular changes at specific pollutant levels are observed directly by measuring the response of a homogeneous human lung cell line to varying levels of O<sub>3</sub>. Early passage (young) and late passage (aged) cells are compared. Normal human lung cells cultured in the environmental chamber for eight days are found to undergo cell structure changes resulting from exposure to 0.5 ppm of O<sub>3</sub>. Both cell structure changes and a growth rate decrease are observed at 0.8 ppm of O<sub>3</sub>. Aged lung cells are found to be more sensitive than young cells to 0.5 ppm of O<sub>3</sub>. C.R.

**A81-47101** Heat stress in the A-10 cockpit - Flights over desert. S. A. Nunneley and C. F. Flick (USAF, School of Aerospace Medicine, Brooks AFB, TX). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 513-516. 15 refs.

The A-10 close-support aircraft is subject to heat stress during low-level flights in hot climates, due to its high task loads and repetitive maneuvering forces. Data from 15 low-level flights over the desert during July 1979 are summarized: the ground dry-bulb temperature was 26-42 C, while the cockpit temperature was generally over 40 C on the ground, and tended to drop progressively throughout the flight; for any given phase it was a linear function of the ground temperature. The small (50 mm) black globe temperature exceeded the cockpit temperature by 2-5 C on the ground and by 4-8 C in flight. The pilot's mean skin temperature was a linear function of the cockpit temperature in each phase. Auditory canal temperature rose from a control value of 37.0 to a mean of 37.4 C in flight; sweat rate was a linear function of the ground dry-bulb temperature, with a weight loss of up to 2.3%. These data are compared to earlier studies of the F-4 and F-111 aircraft. In general, the A-10 environmental control system in the tested aircraft failed to prevent significant heat stress. Pilots noted lowered G-tolerance and increased fatigue on hotter flights. The foot- and leg-area temperature exceeded those at the head. Suggestions for changes in air distribution or for personal cooling systems are presented. J.F.

**A81-47102** Thermal and glycemic responses during mild exercise in +5 to -15 C environments following alcohol ingestion. T. E. Graham (Guelph, University, Guelph, Ontario, Canada). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 517-522. 19 refs. Research supported by the Distilled Spirits Council of United States, Inc.

**A81-47103** Active muscle force and moment response of the human arm and shoulder. A. E. Engin (Ohio State University, Columbus, OH) and L. Kazarian (USAF, Aerospace Medical Research Laboratory, Wright-Patterson AFB, OH). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 523-530. 6 refs. USAF-supported research.

Active muscle force and moment response data of the human arm and shoulder complex when the arm is subjected to various external forces are studied. A subject restraint system, a force application device with three sonic emitters, and an upper arm cuff with four sonic emitters make up the experimental apparatus. The

sonic emitters are used to determine the direction and the location of the force application on the arm and the orientation of the upper arm with respect to the torso. Experiments were conducted on six subjects to determine their active muscle resistance against the external forces working to dislodge their arms from several initial configurations. Mathematical models made from the results are used for the proper simulation of the biodynamic events which take place prior to flail injuries. J.F.

**A81-47104** Some non-auditory correlates of the hearing threshold levels of an aviation noise-exposed population. G. B. Thomas, C. E. Williams, and N. G. Hoger (U.S. Naval Aerospace Medical Center, Naval Aerospace Medical Research Laboratory, Pensacola, FL). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 531-536. 64 refs. Navy-supported research.

A retrospective analysis was made of data collected during the 1963 followup of the Naval Aerospace Medical Research Laboratory Thousand Aviator Study to investigate some of the variables correlated with hearing thresholds. The aim of the study was to develop a multivariate test battery predictive of individual susceptibility to noise-induced hearing loss. When two hearing level groups were identified, normal and impaired, and compared along 33 non-auditory dimensions, they could be differentiated according to their smoking history and eye color. The impaired hearing group reported smoking more cigarettes for a greater period of time than did the normal hearing group; moreover, there was a greater percentage of blue-eyed individuals with impaired hearing than brown-eyed individuals. This is consistent with reports linking temporary hearing loss and eye color (Carter, 1980; Hood, 1976). The other 31 physical, psychological, and sociological measures failed to appear differentially in the two groups. J.F.

**A81-47105** The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance. A. Bellosi, G. Bellosi, and J. de Certaines (Rennes II, Université, Rennes, France). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 537-539. 24 refs. Direction des Recherches, Etudes et Techniques Grant No. 79-257.

Modification in brain functions after exposure to a constant magnetic field are noted to affect the behavior, conditioned reflexes, and cerebral electrogenesis in animals. In particular, the action of magnetic fields on tissular water, i.e. changes in free intracellular water content, the ratio free water/bond water, or the degree of mobility of the bond phase are studied. It was assumed that the relation times obtained by proton nuclear magnetic resonance would be modified after exposure to the magnetic field. Mice were placed in a 0.6 T constant magnetic field for two hours. Brain relaxation times (spin-lattice T<sub>1</sub> and spin-spin T<sub>2</sub>) were measured one to five days after exposure and did not seem compatible with an initial and important modification of the water structure. J.F.

**A81-47106** Comparison of Eustachian tube function measured by the microflow method and a new quantitative impedance method. P. Groth, A. Ivarsson, and O. Tjernstrom (Lund, Universitet; Malmo General Hospital, Malmo, Sweden). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 540-544. 9 refs.

Eustachian tube function in 25 applicants for flight training was tested during simulated flights using two methods alternately; the integrating microflow method with a stationary pressure chamber, and a new quantitative impedance method in combination with a new mobile pressure chamber. All ears were tested by both methods. The results of the various tests did not differ significantly between methods. The reliability of the measurements was good and almost equal in both methods. Several practical advantages with the new impedance method in combination with the mobile pressure chamber make it preferable. (Author)

**A81-47107** Quantification through the surface EMG of muscle fatigue and recovery during successive isometric contractions. J. S. Petrofsky (Wright State University, Dayton, OH). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 545-550. 19 refs. Contract No. F33615-78-C-0501.

**A81-47108** Age-related reactions of rat bones to their unloading. V. E. Novikov and E. A. Il'in (Ministerstvo Zdravookhraneniia SSSR, Institut Mediko-Biologicheskikh Problem, Moscow, USSR). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept.

1981, p. 551-553. 7 refs.

The effect of continued animal growth on bone formation and resorption under conditions of musculoskeletal unloading was investigated. Experiments were carried out on 90 male rats of ages 1, 2.5, and 6 months with initial weights of 110, 225, and 460 g, respectively. The rats were suspended at an angle so that their hindlegs had no support and did not bear weight. After 22 days, the length and width of the diaphysis of the femoral bone and its calcium content were measured. Bone reactions to the suspension (unloading) were found to be age-dependent: the 2.5 month old rats showed the highest increase in bone resorption at the side of the bone marrow canal and in reduction of the cortical layer, whereas the 6-month old rats showed the lowest. Calcium decrease in the femur of suspended rats was found to be less pronounced with age compared to controls. J.F.

**A81-47109**      **The Wolff-Parkinson-White pattern in healthy aircrew.** R. Davidoff, C. L. Schamroth, and D. P. Myburgh (Institute for Aviation Medicine, Pretoria, Republic of South Africa). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 554-558. 15 refs.

The Wolff-Parkinson-White (WPW) syndrome was studied in 22,500 healthy aviation personnel; a resultant prevalence of 0.25% was found. The prevalence of documented tachyarrhythmias in this group was found to be only 1.8%, whereas in a group of referred patients the prevalence was 20%. Classification into Type A and Type B patterns was limited: 45% of the patients could not be categorized with the WPW pattern. Q waves as QS or QR complexes in the inferior limb leads were found in 16.7% of the subjects, and there was Q wave-T wave vector disordance in all subjects. Thirty percent of the patients demonstrated false positive signs of ischaemic heart disease, reflecting the limited value of stress testing. A discussion of the incidence, classification, differential diagnosis, mechanism of tachyarrhythmias, cardiovascular anomalies and treatment is given. J.F.

**A81-47110**      **Chokes - Favorable response to delayed recompression therapy: A case report.** A. Greenstein, D. Sherman, and Y. Melamed (Naval Medical Hyperbaric Institute, Haifa, Israel). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 559, 560. 20 refs.

The pulmonary manifestations of decompression sickness have been attributed to various mechanisms, all of which invoke bubble formation and presence in the lung as the cause of symptoms. A case of persistent 'chokes' syndrome, which responded to recompression 72 h after presentation, is described. The possible physiological mechanisms and the late response to therapy is discussed. (Author)

**A81-47111**      **Risk of coronary heart disease - Risk analysis in the clinical practice of aerospace medicine using a programmable calculator.** W. D. Everett (USAF, School of Aerospace Medicine, Brooks AFB, TX). *Aviation, Space, and Environmental Medicine*, vol. 52, Sept. 1981, p. 561-563. 5 refs.

A simple program for the Hewlett-Packard HP-41 C calculator is presented which allows the practicing flight surgeon to screen asymptomatic aviators for risk of aeromedically significant coronary artery disease. The risk equation used in the program is under ongoing investigation at the USAF School of Aerospace Medicine and will be refined. The program allows the flight surgeon to use risk analysis to select candidates for exercise stress testing and educate aviators on possible benefits to be derived from changes in lifestyle. (Author)



## STAR ENTRIES

**N81-30787** Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Frankfurt am Main (West Germany). Abt. Biophysik.

### EFFECTS OF ACCELERATED HEAVY IONS ON BACILLUS SUBTILIS SPORES: INACTIVATION, REPAIR AND MUTATION INDUCTION

G. Horneck and H. Buecker 1979 11 p Presented at Spore Radiobiol. Meeting, Tokyo, 20 May 1979

Avail: NTIS HC A02

The validity of the assumptions that, if a particle of linear energy transfer (LET) of more than 2,000 MeV sq cm/g hits a spore protoplast, repair of the damage produced will not be possible, nor will a mutation arise, was tested by exposing *Bacillus subtilis* spores to heavy ions (boron, carbon, neon) at different LET values. The reparability of the damage produced, and the frequency of induced mutations were determined (formation of visible colonies on Difco tryptose blood agar base, formation of azide-resistant mutants on plates containing sodium azide). A series of dose survival curves for each bacterial strain, and dose effect curves for mutation induction, were obtained. The data indicate that the LET value of the heavy ion determines the kind of damage to the DNA. Below 2,000 MeV sq cm/g, reparable lesions are produced, with misrepair of such lesions being a possible explanation for high mutation induction. Above 2,000 MeV sq cm/g, irreparable lesions occur, from which mutations are unlikely to arise. Author (ESA)

**N81-30788\*** Rochester Univ., N. Y.

### BIOCHEMICAL ASSAYS OF CULTURED CELLS Final Annual Report, 1 Jun. 1980 - 31 Mar. 1981

Grant H. Barlow (Michael Reese Research Foundation, Chicago) 31 Mar. 1981 14 p

(Contract NAS9-16187)

(NASA-CR-161079) Avail: NTIS HC A02/MF A01 CSCI 06C

Assay systems were developed for use in interpreting samples to be returned on the space shuttle OFT-3 flights. Samples from electrophoretic separation were used to evaluate the techniques. All assays were determinable on the growth media. Approaches are described for assaying: (1) the human granulocyte conditioning factor; (2) urokinase activity; (3) erythropoietin; (4) the molecular form of urokinase; and (5) protein distribution. Other studies are planned to validate that the activity observed is urokinase and not that of other activators or proteases. A.R.H.

**N81-30789#** Argonne National Lab., Ill. Energy and Environmental Systems Div.

### POTENTIAL HEALTH AND SAFETY IMPACTS FROM DISTRIBUTION STORAGE ALCOHOL FUELS

S. E. Rosenberg and J. R. Gasper Jun. 1980 33 p refs

(Contract W-31-109-eng-38)

(ANL/CNSV/TM-61) Avail: NTIS HC A03/MF A01

Literature on the health and safety aspects of the neat alcohols, alcohol-gasoline blends, and typical gasoline are discussed. The toxic properties of each fuel type are identified. Existing standards and regulations are described. The major safety and health risks that would result from the increased use of each type of alcohol fuel are identified. Potential accidents are described and their probable impacts on occupational and public populations are determined. An attempt is made to distill the important health and safety issues and to define gaps in our knowledge regarding alcohol fuels to highlight the further research needed to circumvent potential health and safety problems. DOE

**N81-30790#** Oak Ridge National Lab., Tenn. Biology Div. NOVEL APPROACH TO THE GROWTH OF ANAEROBIC MICROORGANISMS

H. I. Adler and W. D. Crow 1981 19 p refs Presented at 3rd Symp. of Biotechnol. in Energy Production and Conservation,

Gatlingsburg, Tenn., 12-15 May, 1981

(Contract W-7405-eng-26)

(CONF-810554-1) Avail: NTIS HC A02/MF A01

Some of the properties of the *Escherichia coli* membrane fraction are described. Results of a survey of its use with a variety of anaerobic bacteria under several experimental conditions are given. DOE

**N81-30791#** Oak Ridge National Lab., Tenn. Chemical Technology Div.

### VOLUME REDUCTION OF SOLID WASTE BY BIOLOGICAL CONVERSION OF CELLULOSICS

G. W. Strandberg Jun. 1981 20 p refs

(Contract W-7405-eng-26)

(ORNL/TM-7653) Avail: NTIS HC A02/MF A01

The degradability of the types of cellulosic wastes generated in an anaerobic bioreactor was demonstrated. The rate and extent of anaerobic microbial digestion of blotter, paper, cloth, sanitary napkins, and pine sawdust in various types and sizes of bench scale anaerobic bioreactors are described. It is indicated that the resulting digests are amenable to incorporation into hydrofracture grouts. DOE

**N81-30792#** Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Frankfurt am Main (West Germany). Abteilung Biophysik.

### RESPONSE OF BACILLUS SUBTILIS SPORES TO HEAVY ION IRRADIATION USING CELLULOSE NITRATE DETECTORS

M. Schaefer, R. Facius, and H. Buecker 1980 7 p refs

Avail: NTIS HC A02/MF A01

Cellulose nitrate sheets carrying the spores of *Bacillus subtilis* were irradiated with accelerated iron ions under Biostack conditions. The initial energy on the top of the stack was 250 MeV/n with a fluence of 1,000-10,000 particles/sq cm. The energy of the particles for evaluation within the stack varied from 100 MeV/n to 150 MeV/n. A second experiment was performed using argon ions and an energy of 1.4 MeV/n. The spores were incubated directly on the surface of the detector foil, and the outgrowth of individual spores around one single track was observed after different incubation times and was documented by microphotography. For values below 1 micron, a steep decrease of K prime was observed. At higher impact parameters, K prime exceeds the control level in two regions around 1.3 microns and 3 microns with regions of average control survival in between. Author (ESA)

**N81-30793#** Environmental Protection Agency, Research Triangle Park, N.C. Health Effects Research Lab.

### TUMORIGENESIS OF DIESEL EXHAUST, GASOLINE EXHAUST, AND RELATED EMISSION EXTRACTS ON SENCAR MOUSE SKIN

Stephen Nesnow, Larry L. Triplett (ORNL), and Thomas J. Slaga 1980 25 p refs Presented at the EPA 2nd Symp. on Application of Short Term Bioassays in the Analysis of Complex Environ. Mixtures, Williamsburg, Va., 4-7 Mar. 1980

(Contracts W-7405-eng-26; EPA-79-D-X0526;

DOE-40-728-78)

(CONF-800323-4) Avail: NTIS HC A02/MF A01

The SENCAR mouse skin tumorigenesis bioassay for tumor initiation, a quantitative short term in vivo rodent carcinogenesis system which detects a variety of structurally diverse chemical carcinogens was examined. This bioassay system is utilized in evaluating complex environmental mixtures for tumorigenic potential. It provides dose responses with both substances and complex mixtures and is utilized for comparative potency analysis. The tumorigenicity of diesel exhaust particulate emissions was examined using SENCAR mouse skin. The tumorigenic potency of particulate emissions from diesel, gasoline, and related emission sources are compared and the tumorigenic potential of the materials is clearly indicated. E.A.K.

**N81-30794#** Messerschmitt-Boelkow-Blohm G.m.b.H., Otto-brunn (West Germany). Unternehmensbereich Apparate.

### EXPERIMENTAL INVESTIGATIONS AND NEW INSTRUMENTATION FOR Nd:YAG LASER TREATMENT IN UROLOGY

F. Frank, A. Hofstetter (Municipal Hospital, Munich), and E. Keiditsch (Municipal Hospital, Munich) 7 Nov. 1979 16 p refs Presented at Intern. Congr. on Laser Surgery, 2nd Tutorial Gyn. Microsurg. Sem., New Orleans, 9-12 Jan. 1980

(MBB-UA-517/79-OE) Avail: NTIS HC A02/MF A01

A special laser-cystourethroscope developed for transurethral application of laser beams is described. A modified Albassen attachment, using a highly flexible quartz fiber to transmit the laser light, is depicted. The proximal end of the light conductor is used without any sealing window and can be bent through an 80 deg. arc. Since the instrument is used in a water-filled bladder, the end of the light conductor requires no special cleaning or cooling. The absorption and scattering of laser light in tissue determine the significant optical parameters, both depending on wavelength. The extinction behavior of laser light in tissue depends on the type of laser used. The performance of a Nd:YAG laser for urology applications is compared with that of argon and CO<sub>2</sub> type lasers. The deep heating effect of the Nd:YAG laser makes it very suitable for such applications. Author (ESA)

**N81-30795#** Stichting Mathematisch Centrum, Amsterdam (Netherlands). Dept. of Applied Mathematics.

**HETEROCLINIC WAVES OF THE FITZHUGH-NAGUMO EQUATIONS**

J. P. Pauwelussen Oct. 1980 25 p refs Submitted for publication

(MC-TW-209/80) Avail: NTIS HC A02/MF A01

A piecewise linear function is developed to replace the  $f$  of the Mckean treatment. The following equation is employed:  $f(u)$  equals  $F(-U+H(u-a))$ , where  $H$  is the Heavyside step function. The existence and stability of wave solutions are analyzed. In the solutions considered,  $U$  takes on the value  $a$  only once. Three typical wave forms satisfying given boundary conditions are established. The  $U$  component of the first form decreases all the time. The  $U$  component of the second form increases from  $U$  equal to 0 at  $x$  equal to minus infinity to a maximum value and then decreases towards a particular value at  $x$  equal to plus infinity. The  $U$  component of the third form oscillates around the particular  $U$  value approaching this particular value at  $x$  equals infinity. Author (ESA)

**N81-30796#** Stichting Mathematisch Centrum, Amsterdam (Netherlands). Dept. of Applied Mathematics.

**ONE WAY TRAFFIC OF PULSES IN A NEURON**

J. P. Pauwelussen Mar. 1981 34 p refs Submitted for publication

(MC-TW-213/81) Avail: NTIS HC A03/MF A01

The effect of a change in the geometry of a nerve axon on the propagation of potential waves along it is investigated. The existence or nonexistence of these waves depend strongly on the shape of the axon. A sudden increase in membrane area ahead of the wave causes the membrane current to fall. As a result the action potential decreases temporarily; if this potential falls below a certain threshold the wave may be stopped. An analytical method is proposed to study these phenomena. A tree-shaped neuron of infinite extension is employed. The results obtained are also valid for population genetics and chemical reaction theory. Author (ESA)

**N81-30797#** Southampton Univ. (England). Hearing Conservation Unit.

**A MICROCOMPUTER BASED FACILITY FOR PSYCHOACOUSTIC EXPERIMENTATION**

R. J. Halford, P. A. Wilkins, and A. M. Martin Aug. 1980 57 p refs Sponsored by Health and Safety Executive

(ISVR-TR-109) Avail: NTIS HC A04/MF A01

A microcomputer based experimental facility was developed to investigate the effects of wearing hearing protection on the perception of warning sounds. The microcomputer acts as a process controller and a data logger. The facility is capable of presenting complex sound stimuli to subjects from cassette tape recordings, or pure tones generated by a synthesizer. The intensities of the sound stimuli and a background noise can be separately varied over a 70 dB range. The facility also includes a range of loading tasks derived from a television game integrated circuit chip. During the course of an experiment the computer controls the time of presentation and intensity of the sound stimuli, and the operation of the loading task. It also logs data of the presentation of the sound stimuli, the subject's responses to the stimuli, and the subject's performance at the loading task. It is possible to analyze the data using the microcomputer or by feeding it via paper tape to other computers. Author (ESA)

**N81-30798#** National Bureau of Standards, Washington, D.C. National Engineering Lab.

**CRITERIA FOR RECOMMENDING LIGHTING LEVELS**

Gary T. Yonemura Mar. 1981 57 p refs Sponsored in part

by DOE

(PB81-185126; NBSIR-81-2231)

Avail: NTIS

HC A04/MF A01 CSCL 05J

The effect of lighting on behavior which ranges from allowing simple detection of objects to creating moods and impressions was studied. Lighting standards and recommendations for general applications should be based on the visibility requirements where differences between individuals are minimal. It is recommended that conspicuity be the metric for visibility. Subjective visual response criteria should be treated as design options to be applied when they are important aspects of the intended function of the space. The major categories of variables in the perception of the visual environment are presented and organized logically with respect to their relationship in developing lighting criteria and standards. A breakdown of the visual processes into sensory and perceptual components is analyzed. GRA

**N81-30799#** Whitston Associates, Pasadena, Calif.

**ASSESSMENT OF THE USE OF HUMAN FACTORS IN THE DESIGN OF FOSSIL-FIRED STEAM-GENERATING SYSTEMS Final Report**

J. A. Oliver, J. E. Baker, and J. W. Roth Apr. 1981 119 p Sponsored by Electric Power Research Inst.

(EPRI Proj. 1266-20)

(EPRI-CS-1760) Avail: NTIS HC A06/MF A01

A method was developed to evaluate the level of implementation of established human factors data and principles in the design of a present or future fossil fired power plant. The methodology is based on knowing the distribution of human error between three generic locations within the plant and the importance of regarding their impact on the performance of operating and maintenance personnel in generic plant locations. A mathematical expression was developed whereby scores, corresponding to the level of implementation of the selected Human Factors Variables could be assigned. This evaluation technique was applied to three modern fossil fired steam generating systems for verification of its adequacy. Results are presented of comparisons of the three fossil fired steam generating systems to both the electric utility industries and all industries use of human factors data and principles during plant design. DOE

**N81-30800#** University Coll., Cardiff (Wales). Dept. of Applied Mathematics and Astronomy.

**BIOCHEMICAL CHROMOPHORES AND THE INTERSTELLAR EXTINCTION AT ULTRAVIOLET WAVELENGTHS**

Fred Hoyle and N. Chandra Wickramasinghe 1980 11 p refs Avail: NTIS HC A02/MF A01

The existence of bacteria and viruses in interstellar matter is suggested. An average spectrum for interstellar microbes was computed by adding the available ultraviolet spectra over 1900 A for an appropriate selection of organic molecules. The calculated mean absorption curve and astronomical data over the waveband 1900-2800 A agree closely, strongly supporting the contention that chromophores in biomolecules dominate interstellar absorption at these wavelengths. Author (ESA)

**N81-31074\*#** Jet Propulsion Lab., California Inst. of Tech., Pasadena.

**THE SETI PROGRAM PLAN AND INSTRUMENT DEVELOPMENT STATUS**

A. L. Berman and R. B. Crow *In its* The Telecommun. and Data Acquisition Progr. Rept. 42-64 15 Aug. 1981 p 10-17 refs

Avail: NTIS HC A12/MF A01 CSCL 03B

The primary thrust of the SETI (Search for Extraterrestrial Intelligence) Program is to search the microwave region of the spectrum for signals of extraterrestrial intelligent origin. The SETI program plan and current SETI breadboard instrument development activities are described. J.M.S.

**N81-31455#** Amsterdam Univ. (Netherlands).

**THE EFFECT OF NOISE ON THE VESTIBULAR SYSTEM**

W. J. Oosterveld, A. R. Polman (Royal Dutch Airlines, Schiphol), and J. Schoonheydt (Royal Dutch Airlines, Schiphol) *In* AGARD Aural Commun. in Aviation Jun. 1981 5 p refs

Avail: NTIS HC A09/MF A01

The aim of the study was to find out if men with a noise induced hearing loss had detectable functional changes in the

functioning of their vestibular system. The study was carried out in a group of 29 technicians who had worked in the rather noisy environment of the workshop for more than five years and all had a hearing loss on both ears of more than 40 dB on the tone audiogram at the frequency of 4000 Hz. The vestibular examinations showed that 18 of the 29 persons (62%) had spontaneous nystagmus with a speed of the slow component exceeding 5 deg/second. A positional nystagmus exceeding 5 deg/second, appearing in three or more positions, was found in 24 subjects (83%). In all cases the nystagmus was direction fixed. A cervical nystagmus could be provoked in 17 subjects (59%). T.M.

**N81-31457#** Southampton Univ. (England). Audiology and Human Effects Group.

#### **ASSESSING THE EFFECTIVENESS OF AUDITORY WARNINGS**

Peter A. Wilkins *In* AGARD Aural Commun. in Aviation Jun. 1981 13 p refs Sponsored in part by the United Kingdom Health and Safety Executive

Avail: NTIS HC A09/MF A01

Two laboratory experiments and a field study are described which found that while inattention need not necessarily impair the perception of an auditory warning, the combination of inattention and the need to recognize the warning may result in failures in the perception of sounds which can be heard and recognized when listened for deliberately. The results indicated that to be effective a warning sound should be distinct from both the ambient noise and other nonsimultaneous discrete sounds present. T.M.

**N81-31461#** Royal Netherlands Air Force, Soesterberg. Aeromedical Dept.

#### **HEARING STANDARDS FOR AIRCREW**

Martin P. C. Gloudemans *In* AGARD Aural Commun. in Aviation Jun. 1981 4 p

Avail: NTIS HC A09/MF A01

Standards for aircrew in six NATO countries were examined. The large discrepancy in audiometric requirements from country to country is discussed. Emphasis is placed on those tests that examine speech recognition in quiet and in noise environments. T.M.

**N81-31469#** Air Force Inst. of Aviation Medicine, Fuerstenfeldbruck (West Germany).

#### **EFFECTS OF AGE, FLYING TIME AND TYPE OF AIRCRAFT ON THE HEARING OF GERMAN MILITARY PILOTS, AND ITS SIGNIFICANCE FOR INFLIGHT COMMUNICATION**

G. R. Froehlich *In* AGARD Aural Commun. in Aviation Jun. 1981 3 p

Avail: NTIS HC A09/MF A01

The analysis of pure tone audiograms of 4,034 German military pilots revealed that 73% of total ears have normal hearing up to at least 6000 Hz, 26% have only very slight hearing losses above 2000 Hz with 22 + or 14 dB at 3000 Hz, 36 + or - 18 dB at 4000 Hz, and 40 + or - 18 dB at 6000 Hz. This allows reliable speech communication in every day life and aboard the aircraft. The total of marked hearing losses requiring a waiver was 0.65%, mostly unilateral with prevalence of the left ears and induced by impact noise on the shooting range in the early stages of the career. Thus, from the pilots' side, all higher speech frequencies are available for improved voice communication systems and should be used in high noise environment. T.M.

**N81-31471#** Army Aeromedical Research Lab., Fort Rucker, Ala.

#### **HEARING IMPAIRED AVIATORS IN THE U.S. ARMY**

Susan Liff and Jerod L. Goldstein *In* AGARD Aural Commun. in Aviation Jun. 1981 3 p ref

Avail: NTIS HC A09/MF A01

An audiometric profile of a group of US Army aviators who had failed to meet the minimal acceptable hearing loss standard and were granted permission to continue to fly under medical waiver is presented. The flight safety records of this group were evaluated to determine if any relationship existed between hearing loss and flight mishaps or accidents involving these individuals. T.M.

**N81-31472#** Ministry of Defence, London (England). Directorate of Civilian Medical Services.

#### **HEARING CONSERVATION**

S. Kanagasabay *In* AGARD Aural Commun. in Aviation Jun. 1981 6 p refs

Avail: NTIS HC A09/MF A01

Impairment of hearing is one of the adverse effects of noise. The measures adopted to minimize hearing impairment, conveniently termed Hearing Conservation, include specifying an acceptable noise exposure, identification of personnel at risk, provision of suitable protective equipment, limitation of exposure time where this is necessary and medical monitoring by audiometry. Proposals in the United Kingdom for noise criteria and for audiometry in industry are presented. T.M.

**N81-31809** Materials Research Labs., Ascot Vale (Australia). **RECORDS OF AUSTRALIAN FOULING ORGANISMS: SESSILE BARNACLES (CRUSTACEA, CIRRIPIEDIA)**

John A. Lewis Apr. 1981 29 p refs

(MRL-R-809; AR-002-407) Copyright. Avail: Issuing Activity

Ten species of barnacle collected during studies on marine fouling at defense exposure sites in Queensland, New South Wales, Victoria, and Western Australia are described. Morphological and systematic characters of balanomorph barnacles are described and a taxonomic key is presented to enable these important fouling organisms to be routinely identified. E.A.K.

**N81-31810\*#** California Univ., Berkeley. Environmental Physiology Lab.

#### **EFFECTS OF THE COSMOS 1129 SOVIET PASTE DIET ON BODY COMPOSITION IN THE GROWING RAT**

Nello Pace, Donald F. Rahlmann, Arthur H. Smith, and Grover C. Pitts 16 Feb. 1981 58 p refs

(Grant NSG-7336)

(NASA-CR-164725; EPL-81-1)

Avail: NTIS

HC A04/MF A01 CSDL 06C

Six Simonsen albino rats (45 days of age) were placed on a regimen of 40 g/day the semipurified Soviet paste diet used in the 18.5 day Cosmos 1129 spacecraft was to support the rats for various experiments on the physiological effects of weightlessness. The animals were maintained on the Soviet paste diet for 35 days, metabolic rate was measured and body composition was determined by direct analysis. The results were compared with a control group of rats of the same age, which had been kept on a standard commercial grain diet during the same period of time. E.A.K.

**N81-31811#** California Univ., Berkeley. Lawrence Berkeley Lab. Biology and Medicine Div.

#### **RADIATION BIOPHYSICS RESEARCH Annual Report, 1979 - 1980**

Mar. 1981 166 p refs

(Contract W-7405-eng-48)

(LBL-11700) Avail: NTIS HC A08/MF A01

Progress is reported from the following research groups and/or areas: research medicine; Donner Pavilion; Peraita Cancer Research Institute; environmental physiology; radiation biophysics and structural biophysics. DOE

**N81-31812#** Oak Ridge National Lab., Tenn. Chemical Technology Div.

#### **BIOLOGICAL REDUCTION OF NITRATE WASTEWATER USING FLUIDIZED-BED BIOREACTORS**

J. F. Walker, Jr., C. W. Hancher, B. D. Patton, and M. Kowalchuk

(Goodyear Atomic Corp., Portsmouth, Ohio) 1981 37 p refs

Presented at the 3rd Symp. on Biotechnol. in Energy Production and Conserv., Gatlinburg, Tenn., 12-15 May 1981

(Contract W-7405-eng-26)

(CONF-810554-2) Avail: NTIS HC A03/MF A10

There are a number of nitrate-containing wastewater sources in the nuclear fuel cycle as well as in many commercial processes such as fertilizer production, paper manufacturing, and metal finishing. These nitrate-containing wastewater sources can be successfully biologically denitrified to meet discharge standards by the use of a fluidized-bed bioreactor. The major strain of denitrification bacteria is *Pseudomonas* which was derived from garden soil. In the fluidized-bed bioreactor the bacteria are allowed to attach to 0.25 to 0.50-mm-diam. coal particles, which are fluidized by the upward flow of influent wastewater. A description is given of the results of two bionitrification R and D pilot plant programs. DOE

**N81-31813#** Pennsylvania State Univ., University Park. Dept. of Microbiol. and Cell Biol.

**MEMBRANE-MEMBRANE INTERACTIONS IN A LIPID-CONTAINING BACTERIOPHAGE SYSTEM Progress Report, 1 Oct. 1980 - 30 Sep. 1981**

Wallace Snipes May 1981 8 p refs  
(Contract DE-AS02-76EV-02311)

(DOE/EV-03211/32) Avail: NTIS HC A02/MF A01

Virus cell interactions and the mechanism of viral entry are the major focal points of this research. A method of analysis was perfected to investigate the entry process for herpes simplex virus. This technique makes use of a photosensitizing dye, FITC, that covalently binds to viral envelope proteins. Treated virions remain photosensitive until the envelope is shed during the process of infection. Data strongly support an entry mechanism in which the viral envelope fuses with the cell plasma membrane. Other related projects involved studies of the virucidal properties of retinoids, plaque development characteristics for viruses surviving treatment with membrane perturbors, and a large plaque effect that occurs when virus are plated on cells pretreated with UV light. DOE

**N81-31814#** Tennessee Univ., Knoxville.

**REPAIR AND CELL CYCLE RESPONSE IN CELLS EXPOSED TO ENVIRONMENTAL BIOHAZARDS**

Daniel Billen and Charles T. Hadden 1981 14 p refs Prepared in cooperation with Oak Ridge National Lab., Tenn.

(Contract DE-AS05-76EV-04568)

(DOE/EV-04568/T1; ORO-4568-30) Avail: NTIS HC A02/MF A01

Excision and recombination in the repair of damage by 8-methoxypsoralen (8-NOP) in bacillus subtilis was investigated. Topics discussed are: (1) repair of damage by psoralen plus near-UV light; (2) in vitro repair of transforming DNA; (3) photobiology of halogenated DNA; and (4) DNA repair in toluene treated Escherichia coli containing BU DNA. DOE

**N81-31815#** State Univ. of New York, Brooklyn. Dept. of Radiation Oncology.

**BIOLOGICAL EFFECTS OF IONIZING RADIATION AT THE MOLECULAR, CELLULAR, AND ORGANISMAL LEVELS Progress Report, 15 Oct. 1978 - 14 Oct. 1981**

Christopher S. Lange Jun. 1981 15 p refs

(Contract DE-AC02-80EV-10503)

(DOE/EV-10503/1) Avail: NTIS HC A02/MF A01

The original Zimm theory of rotor speed dependent DNA sedimentation was tested quantitatively and found to be correct. The quantitative validity of the theory means that the size of a DNA sedimenting under speed-dependent conditions is not undefinable but rather can be uniquely obtained by the application of that theory to the data. The viscoelastic recoil, or more accurately, the zero shear rate reduced recoil is shown to be a quantitative direct function of the number of intact DNA molecules present (per ml) in solution. T.M.

**N81-31817** Rice Univ., Houston, Tex.

**A STATISTICAL INVESTIGATION OF THE PULMONARY EFFECTS OF EXPOSURE OF ASBESTOS Ph.D. Thesis**

Edward Neely Atkinson 1981 490 p

Avail: Univ. Microfilms Order No. 8116938

Data collected on a group of 1112 workers formerly employed in the production of insulation containing amosite asbestos at a plant in Tyler, Texas are examined and a subset of continuously employed workers with no other known exposure to asbestos is selected for detailed analysis. The response variables examined are scores for tests of pulmonary mechanics and the explanatory variables are age, height, weight, race, employment history and smoking behavior; the method of analysis is linear least squares regression. The numerical problems associated with presence of strong correlations in the data matrix are considered, and a method for the choice of a subset regression which attempts to alleviate these problems is proposed. Equations for each lung function test are selected and examined in detail. Regression techniques are used to attempt to detect an interactive effect between smoking and asbestos exposure with respect to lung function; such an effect has been reported with respect to carcinoma of the lung. No interactive effect is detected. Finally, maximum likelihood estimation is used to identify a subset of workers who seem particularly susceptible to the effects of asbestos. Dissert. Abstr.

**N81-31818#** Oregon State Univ., Corvallis. Dept. of Agricultural Chemistry.

**METABOLISM OF HYDRAZINE Final Report, 1 Oct. 1979 - 30 Sep. 1980**

F. N. Dost, D. J. Broderick, B. M. Krivak, and D. J. Reed Jun. 1981 16 p refs

(Contract F33615-79-C-0517; AF Proj. 2312)

(AD-A101849; AFAMRL-TR-81-26) Avail: NTIS HC A02/MF A01 CSCI 06/16

In rats exposed to atmospheric hydrazine, the log of blood hydrazine concentration was found to bear a more or less linear relation to atmospheric hydrazine levels. At 20-25 mg hydrazine/cu M, blood concentrations approached 100 nmole/ml, and were about 2 nmole/ml at atmospheric concentrations of about 3 mg/cu M. During exposure, blood concentrations tended to rise rather quickly in the first hour, then oscillated slowly around a generally constant level throughout six hours of exposure. Blood concentration of hydrazine following a single 1 nmole/kg dose decreased with a first phase halftime of about 45 minutes followed by a slower decrease with halftime of 27 hours. Less than one percent of such doses was excreted in bile. In vitro reaction of 5 m molar hydrazine in whole blood proceeded at a rate of about 0.016 micromole/ml/minute or about 10% in 30 minutes. With higher concentrations turnover becomes more rapid and can exceed the hemoglobin subunit equivalence by many fold. Extensive efforts to locate <sup>15</sup>N/labelled urinary metabolites that would account for remaining uninventoryed hydrazine have not yet succeeded. Author (GRA)

**N81-31819#** QEI, Inc., Burlington, Mass.

**IN SUPPORT OF THE JOINT ARMY/NAVY AIRCREW IMPACT INJURY PREVENTION PROGRAM Annual Report, 17 Oct. 1979 - 15 Dec. 1980**

Harvey E. Sbisa and Rodney Thorpe, W. 15 Dec. 1980 14 p (Contract N00014-78-C-0121; NR Proj. 207-114)

(AD-A102505; IM-151280-1) Avail: NTIS HC A02/MF A01 CSCI 06/5

In one part of this study, research was performed and data collected on the response of the living human to a wide range of impact-accelerative forces applied to the human along various vectors. In this area data bases were reorganized and updated, computer programs were designed, implemented, tested and/or used to maintain, update, search and/or summarize information in these data bases. Motion pictures were digitized, EKG data were processed and a graphical analysis display system was designed and implemented. In the second area, research was performed to determine the effects of ship motions on humans. Performance tests were generated and computer programs were written to edit output from these tests and for analysis of the test outputs. GRA

**N81-31820#** Strategic Air Command, Offutt AFB, Nebr. Aircraft Engineering Div.

**AIRCREW SHIELDING TO FAST NEUTRONS FROM NUCLEAR DETONATIONS Final Report**

Rayford P. Patrick 1 Jul. 1981 13 p

(AD-A102239; SAC/LGME-ER-S-115; Avail: NTIS HC A02/MF A01 CSCI 18/6

Future technological advances by enemy nations could compromise the effectiveness of our nuclear hardened manned systems. This study addresses the feasibility of incorporating fast neutron shields into the systems. Such shielding would enhance systems survivability and be very compatible with the use of advanced ECM and bomber defense systems such as missiles, LASERs, and particle beam weapons. It is shown that shielding providing mission completion capability for human aircrews (hence to manned systems) is technically feasible, cost effective, and relatively lightweight. Therefore it is argued that weight and space provisions (at the very least) of such shielding be incorporated into the design of new manned systems. Author (GRA)

**N81-31821#** Argonne National Lab., Ill. Center for Human Radiology.

**TOWARD A THEORY OF THE INITIATION OF CANCER BY IONIZING RADIATION: TRACK STRUCTURE ANALYSIS FOR ELECTRONS AND ALPHA PARTICLES IN WATER**

Antonio Pagnamenta (Illinois Univ., Chicago) and John H. Marshall 1980 12 p refs Presented at the 7th Symp. on Microdosimetry, Oxford, UK, 8-12 Sep. 1980

(Contract W-31-109-eng-38)

(CONF-800944-8) Avail: NTIS HC A02/MF A01

Following a method of Kim, differential cross sections were constructed in analytical form for the ionization of water by electrons and alpha particles. By generalizing Wideroe's bookkeeping method the number of higher order delta rays were found.

DOE

**N81-31822#** Oak Ridge National Lab., Tenn.

# **DOING A RISK ANALYSIS**

H. Inhaber 1981 18 p Presented at the 2nd Ann. Eastern Reg. Safety Congr., Philadelphia, 30 Apr. 1981 (Contract W-7405-eng-26)

(CONF-810480-1) Avail: NTIS HC A02/MF A01

The methodologies which can be used to determine the overall risk of any energy system are outlined. Termed risk accounting, it is calculated in analogy to energy accounting, which attempts to determine all the energy inputs into a system in comparison to the net output. The most important conclusion of this analysis is that the risk from non-conventional energy sources can be as high as, or even higher than that of conventional sources. In particular, it tends to be considerably higher than that of nuclear power, the newest of the conventional sources. The ratio is, in some cases, as high as 10 or 100. The results can be divided into occupational risk, borne by those who construct, fabricate and maintain the energy sources, and danger to members of the public. The total risk of a system is then the sum of occupational and public risk. The occupational man-days lost per unit energy averaged over the system lifetime are given.

DOE

**N81-31823#** Argonne National Lab., Ill. Center for Human Radiobiology.

# **TOWARD A THEORY OF THE INITIATION OF CANCER BY IONIZING RADIATION. THE TWIN DOUBLET PAIR MODEL**

John H. Marshall and Antonio Pagnamenta (Illinois Univ., Chicago) 1980 11 p refs Presented at the 7th Symp. on Microdosimetry, Oxford, UK, 8-12 Sep. 1980

(Contract W-31-109-eng-38)

(CONF-800944-7) Avail: NTIS HC A02/MF A01

Models are proposed which explain the mechanism of action on a molecular level for the initiation of cancer by electrons or alpha particles.

DOE

**N81-31824#** Oak Ridge National Lab., Tenn. Industrial Safety and Applied Health Physics Div.

# **HEALTH EFFECTS OF LOW-LEVEL RADIATION**

John A. Auxier 1981 4 p Presented at the Am. Nucl. Soc. Ann. Meeting, Miami Beach, Fla., 7 Jun. 1981

(Contract W-7405-eng-26)

(CONF-810606-47) Avail: NTIS HC A02/MF A01

The bases for setting and the adequacy of radiation protection standards are reviewed.

DOE

**N81-31825#** Defence Research Information Centre, Orpington (England).

# **COMPARISON BETWEEN THE HEAT LOSS AND HEAT GAIN THROUGH THE LUNGS AND BODY SURFACE DURING HYPOTHERMIA AND ITS TREATMENT**

A. Low and H. Goethe Apr. 1981 29 p refs Transl. into ENGLISH from Intern. Arch. of Occupational and Environ. Health (West Germany), v. 45, 1980 p 231-249

(DRIC-T-6307; BR78676) Avail: NTIS HC A03/MF A01

Treatment of hypothermic patients by means of central body rewarming (CBRW), i.e., through inhalation of warm and humidified air or oxygen, is compared with the classical warm bath treatment in a critical survey of the literature. Heat uptake via the lungs is greater when the inspired air (maximally 45 C) is saturated with water vapor. This heat is transferred totally to the thoracic blood and then to the heart and brain. There, respiratory and vasomotor centres are rapidly stimulated. During warm bath therapy, rectal temperature increases faster but esophageal and tympanic temperatures and thus brain temperature rise slower than during CBRW. In CBRW the dangerous after-drop either does not occur or its effect is minimized, and the danger of a rewarming collapse is nonexistent. Assisted ventilation in CBRW leads to an even more rapid rise in core temperature.

Author (ESA)

**N81-31826#** Bureau of Radiological Health, Rockville, Md. Div. of Compliance.

# **AN EVALUATION OF RADIATION EMISSION FROM VIDEO**

## **DISPLAY TERMINALS Final Report**

Feb. 1981 73 p refs

(PB81-198483; FDA/BRH-81/57; DHHS/PUB/FDA-81-8153) Avail: NTIS HC A04/MF A01 CSCL 13L

The video display terminals (VDTs) to determine emission of ionizing and nonionizing radiation were evaluated. Measurements for ionizing radiation were performed on 125 VDT's; 34 were measured for nonionizing radiation emission. The sources of radiation are discussed, with emphasis on circuit analysis and critical components that may cause radiation. The radiation emission data are reported. Emission values from video display terminals were found to be within existing state, federal, and international guidelines.

GRA

**N81-31827#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

## **SIXTH ADVANCED OPERATIONAL AVIATION MEDICINE COURSE**

J. Bande, ed. May 1981 103 p refs Partly in ENGLISH; partly in FRENCH Course Held at Brussels, Belgium, 24-28 Mar. 1980

(AGARD-R-681; ISBN-92-835-0293-0)

Avail: NTIS HC A06/MF A01

The cardiological problems of selection and screening flying personnel are addressed. The epidemiology and prevention of heart diseases are discussed. Special emphasis is placed on the cardiovascular problems and follow-up of pilots of new generation, high performance aircraft.

**N81-31828#** Cliniques Univ. Saint-Luc, Brussels (Belgium). Service de Cardiologie.

## **NON-INVASIVE EVALUATION OF THE CORONARY CIRCULATION**

Jean-Marie R. Detry and Jacques A. Melin In AGARD 6th Advan. Operational Aviation Med. Course May 1981 p 1-10 refs

Avail: NTIS HC A06/MF A01

Coronary artery disease (CAD) is a major medical problem since it is the first cause of mortality and morbidity in the middle aged active population. The early detection of CAD is important since subjects with latent CAD have a much higher incidence of unexpected coronary events as compared to the normal population; as far as occupational medicine is concerned, these subjects should be identified since they may be suddenly incapacitated while on essential duties such as taking off or landing a plane. Among noninvasive diagnostic methods, the role of the history, the value of the exertional ECG and the additional information given by Thallium scintigraphy and radionuclide angiography were examined.

T.M.

**N81-31829#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

## **NATO REGULATIONS ON THE CARDIO-VASCULAR SYSTEM**

Evrard E. In its 6th Advan. Operational Aviation Med. Course May 1981 10 p

Avail: NTIS HC A06/MF A01

The official regulations are the juridical base of all medical decisions concerning fitness for the flying duties. The regulations are presented for each member country in NATO. All the regulations require the circulatory system to be sound, as checked by clinical, radiological, and electrocardiographic examination. The examination procedures and clinical operations were reviewed and examined as to their validity for current NATO requirements.

T.M.

**N81-31830#** Centre Principal d'Expertises Medicales du Personnel Navigant, Paris (France).

## **THE APPLICATION OF CARDIOGRAMS IN THE VALUATION OF NAVIGATION PERSONNEL [APPORT DES MECANOGRAMMES CARDIAQUES DANS L'EXPERTISE DU PERSONNEL NAVIGANT]**

R. Carre In AGARD 6th Advan. Operational Aviation Med. Course May 1981 10 p In FRENCH

Avail: NTIS HC A06/MF A01

Cardiograms provide valuable information for the determination of flight fitness. Several applications of cardiograms are discussed and include: the analysis of the effects of respiration on the cardiovascular system through phonocardiography; the



study of arterial distention with the use of carotidograms; and the creation of an index of chronocardiographic measurement for systolic pressure and blood flow. T.M.

**N81-31831#** Service de Medecine Aeronautique, Versailles (France).

**ECHOCARDIOGRAPHY IN AVIATION MEDICINE [ECHO-CARDIOPHIE EN MEDECINE AERONAUTIQUE]**

G. Leguay and J. Droniou (Service de Cardiologie, Paris, France) /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 8 p In FRENCH

Avail: NTIS HC A06/MF A01

The principles and techniques of echocardiography are discussed. The applications of echocardiography in flight examinations are described and include the early detection of heart disease, diagnosis myocardial infarction, and the examination of the cardiac ventricles. Emphasis is placed on the non-invasive aspect of echocardiography. T.M.

**N81-31832#** Centre Principal d'Expertises Medicales du Personnel Navigant, Paris (France).

**PRINCIPAL ELECTROCARDIOGRAPHIC ANOMALIES IN THE VALUATION OF NAVIGATION PERSONNEL [PRINCIPALES ANOMALIES ELECTROCARDIOGRAPHIQUES DANS L'EXPERTISE DU PERSONNEL NAVIGANT]**

Raymond Carre /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 8 p In FRENCH

Avail: NTIS HC A06/MF A01

The pilots of high performance aircraft undergo many extremes in physiological stress. It is essential to flight safety that the cardiovascular system of a pilot be in top working condition. Electrocardiography provides much of the biomedical data necessary for the valuation of flying personnel. Anomalies in electrocardiographic analysis are discussed and their importance in the overall diagnosis of flying personnel is emphasized. The anomalies include: troubles in analyzing rhythmic variations; the Wolff-Parkinson-White syndrome; the incomplete discription of blockage in right branches of the heart; and the effects of turbulence on ventricular function. T.M.

**N81-31833#** School of Aerospace Medicine, Brooks AFB, Tex. **TREADMILL TESTING FOR THE DETECTION OF ASYMPTOMATIC CORONARY DISEASE IN THE HEALTHY MALE** James R. Hickman, Jr. /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 9 p refs

Avail: NTIS HC A06/MF A01

The poor predictive accuracy of the treadmill test for latent coronary artery disease is discussed. Emphasis is placed on the problem of false positive exercise tests. The treadmill test is regarded as a risk factor and as a part of the total risk factor mosaic rather than as a definitive test for coronary artery disease. Methods that are available for the detection of CAD are presented. T.M.

**N81-31834#** Service de Sante des Armees, Toulon (France). **CONTINUOUS RECORDING OF THE ECG ACCORDING TO THE HOLTER METHOD [ENREGISTREMENT CONTINU DE L'E.C.G. SELON LA METHODE DE HOLTER]**

G. Leguay and A. Seigneux, (Medecin des Hopitaux) /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 9 p refs In FRENCH

Avail: NTIS HC A06/MF A01

The three parts of continuous electrocardiography are discussed: the recording equipment, the reader, and the information system that is utilized to process the data. Applications of ambulatory electrocardiographic monitoring are described. Special problems are highlighted and include arrhythmias in patients with mitral valve prolapse and ventricular arrhythmias due to exercise or myocardial infarction. T.M.

**N81-31835#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France). Dept. of Cardiology. **EPIDEMIOLOGICAL BASIS FOR THE PREVENTION OF CORONARY HEART DISEASE**

G. DeBacker (Akademisch Ziekenhuis) /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 7 p refs

Avail: NTIS HC A06/MF A01

Coronary heart disease (CHD) is an important cause of premature death and disability in the economically active population of most industrialized countries. Therefore there is a great need for measures to control this mass disease. The controversies concerning links between life styles, behavioral factors and the risk of CHD are discussed. Preliminary results of an ongoing controlled preventive trial are presented. T.M.

**N81-31836#** Militair Hospitaal Brussel (Belgium).

**PREVENTION OF CARDIOVASCULAR DISEASES**

H. Kesteloot /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 4 p refs

Avail: NTIS HC A06/MF A01

Cardiovascular diseases, especially those caused by coronary heart disease account for 55% of the total death rate in Belgium and are three times more important than cancer. Modern epidemiological research underlined the multifactorial origin of cardiovascular diseases and identified several risk factors. A survey of the most important risk factors influencing cardiovascular mortality is presented. Various recommendations are provided in order to decrease the adverse effects of these risk factors with regard to health and life expectancy. T.M.

**N81-31837#** Royal Air Force Hospital, Halton (England).

**CARDIOVASCULAR PROBLEMS DURING THE PILOTS CAREER**

J. N. C. Cooke /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 3 p refs

Avail: NTIS HC A06/MF A01

In a population which is highly selected at entry and which is generally composed of the younger age groups in the Air Force the pattern of cardiovascular problems tends to depart from that of the general population. In particular congenital heart disease, valvular disease, and hypertensive heart disease consequent upon chronic renal disease are comparatively rare. The effects of repeated regular physical and ECG examinations of aircrew also tend to produce special problems of the elucidation of presymptomatic cardiovascular disease rather than the magement of symptomatic patients. The following subjects are discussed: essential hypertension; ischaemic heart disease; arrhythmias; and myocarditis, including sarcoidosis. T.M.

**N81-31838#** School of Aerospace Medicine, Brooks AFB, Tex. **DISPOSITION OF ELECTROCARDIOGRAPHIC ABNORMALITIES IN AVIATION**

James R. Hickman, Jr. /In AGARD 6th Advan. Operational Aviation Med. Course May 1981 13 p refs

Avail: NTIS HC A06/MF A01

The present criteria for disposition of electrocardiographic abnormalities in United States Air Force aviators are based upon findings within the flying population and observation of the natural history of specific electrocardiographic findings. The electrocardiogram is a laboratory test requiring a history, physical examination, and other laboratory tests for interpretation. Serial ST and T wave changes, ectopic atrial and ventricular beats, ventricular tachycardia, supraventricular tachycardia, conduction abnormalities such as right and left bundle branch block, Wolff-Parkinson-White electrocardiographic finding, sinus bradycardia, and sinus pauses are discussed. The current aeromedical dispositions for these abnormalities are also discussed. The disposition of certain aeromedical abnormalities will remain flexible and continue to evolve as more experience is gained in dealing with healthy aviators. T.M.

**N81-31839** Connecticut Univ., Storrs.

**MODELING THE EFFECTS OF SUSTAINED ACCELERATIONS ON PILOT TRACKING PERFORMANCE** Ph.D. Thesis

Jonathan Korn 1980 110 p

Avail: Univ. Microfilms Order No. 8116733

Various types of acceleration (G) forces are frequently experienced in fighter aircraft. These forces subject the pilot to physiological and mental stress, that, conceivably, could degrade pilot-vehicle performance. In a laboratory, simulated aerial tracking experiments are a traditional and convenient method of evaluating pilot performance in a G field. In order to complement past experimental research, it is essential to evaluate pilot performance under acceleration stress analytically. The Aerospace Medical

Research Laboratory (AMRL) experimental results are analyzed and a normative pilot performance model was developed. This model was validated using the empirical data. Dissert. Abstr.

**N81-31840** Temple Univ., Philadelphia, Pa.  
**THE EFFECTS OF ALTERED SENSORY INPUT ON A SKILLED MOTOR TASK** Ph.D. Thesis

Rebecca Lynn Craik 1981 213 p  
 Avail: Univ. Microfilms Order No. 8115862

The manner in which altered visual input modifies the voluntary motor behavior seen during stair walking was characterized. Precontact muscle activity was diminished and landing was altered for each of the experimental conditions. These results imply that there is adequate time for a sensory perturbation which occurs during the swing phase to alter the subsequent landing. Conclusions from this study are as follows: vision is necessary for optimal stair walking performance; the subject's pre-task execution expectation can alter subsequent motor performance; the relationship between precontact gastrocnemius-soleus muscle activity and the subsequent landing is related to landing strategy; visual information predominates when there is a conflict between visual and other sensory information; and specific visual information is necessary for the input from the visual system to override the other sensory systems.

Dissert. Abstr.

**N81-31841#** Research Inst. of National Defence, Stockholm (Sweden).

**TRAINING FOR RELAXATION. AN EXPERIMENT AT THE MILITARY FLIGHT SCHOOL [AVSLAPPNINGSTRAENING, ETT FOERSOEK VID KRIGSFlygskolan]**

Erland Svensson, Maud Thanderz, and Lars-Eric Unestaahl Feb. 1980 43 p refs In SWEDISH  
 (FOA-C-59003-H9) Avail: NTIS HC A03/MF A01

A review of psychological training methods is given with emphasis on the use of these methods among athletes and flight crews. Both basic psychological training, including various relaxation methods, and training dedicated to aid specific problems are discussed in terms of increased performance. Relaxation training for exercising adults and elite athletes is discussed as well as relaxation training within the Air Force. The results do not reinforce a relationship between relaxation training and altered performance. J.M.S.

**N81-31842#** New Jersey Inst. of Tech., Newark. Dept. of Electrical Engineering.

**DYNAMICS OF TWO-DIMENSIONAL EYE-HEAD TRACKING** Final Report

Andrew U. Meyer 15 Jun. 1981 130 p refs  
 (Grant AF-AFOSR-0114-80; AF Proj. 2313)  
 (AD-A102369; AFOSR-81-0610TR) Avail: NTIS  
 HC A07/MF A01 CSCL 06/16

Two dimensional target tracking where eye and/or head motion is used for control was examined. A tracking method involving electroculography (EOG) and two tracking schemes using a remote oculometer, one with and one without a visual feedback display was studied. Each tracking method involves eye head coordination. The tests were conducted with human subjects and involved tracking of targets in two dimensional quasirandom motion. All tests were conducted at three different target amplitude levels to study possible nonlinear effects. The frequency response spectrum and a statistical evaluation of the tracking performance were obtained for each tracking run. Average frequency responses are presented for each of three different levels of maximum target field sizes. The overall dynamics of the three tracking methods are represented in compact form of describing function models whose parameters were identified from the averaged frequency responses. E.A.K.

**N81-31843#** California Univ., Los Angeles. Medical Center.  
**NEURONAL ADAPTIVE MECHANISMS UNDERLYING INTELLIGENT INFORMATION PROCESSING** Final Scientific Report

Charles D. Woody May 1981 58 p refs  
 (Grant AF-AFOSR-3074-76)  
 (AD-A101908; AFOSR-81-0574TR) Avail: NTIS  
 HC A04/MF A01 CSCL 05/1

By means of this grant, advances were made in: 1. Identifying key features controlling adaptation in neural networks. 2. Developing and calibrating a device for pressure injection of minute volumes through fine micropipettes. 3. Examining, intracellularly, the response of single cortical neurons to: a. a

behavioral unconditioned stimulus used to produce conditioned behavior; b. an unconditioned stimulus produced by direct electrical activation, antidromically, of single, pyramidal tract neurons; and c. direct application of pharmacologic agents thought to cause neural adaptation. 4. Simulating adaptive features of single neurons. 5. Altering rates of acquisition of conditioned behavior by direct neuromodulatory procedures. The results have led to an improved understanding of neuronal adaptive mechanisms underlying intelligent information processing by the brain and afford the design of improve components for use in artificial intelligence. Author (GRA)

**N81-31844#** Decision Research Corp., Eugene, Oreg.  
**THE EFFECTS OF GENDER AND INSTRUCTIONS ON CALIBRATION**

Sarah Lichtenstein and Baruch Fischhoff Jul. 1981 29 p refs  
 (Contract N00014-80-C-0150)  
 (AD-A102255; PTR-1092-81-7) Avail: NTIS  
 HC A03/MF A01 CSCL 05/9

Two groups of subjects assessed their confidence in the accuracy of their answers to 200 general-knowledge two-alternative items. One group was given short instructions and the other lengthy instructions. The appropriateness of their confidence, called calibration, proved to be unrelated to both length of instruction and subjects' gender. All but five of the 71 subjects were at least somewhat overconfident; only six could be described as pretty well calibrated. Author (GRA)

**N81-31845#** Research Inst. of National Defence, Stockholm (Sweden).

**SIMILARITY OF DISTORTED PICTURES: ON THE INTERACTION BETWEEN EDGE BLUR AND RANDOM NOISE**

Lena Linde Apr. 1981 35 p refs  
 (FOA-C-53004-H9) Avail: NTIS HC A03/MF A01

The experienced similarity between distorted still pictures was investigated. The distorting stimulus variables, random noise and edge blur were varied according to a factorial design. The digitized scenes were nonfigurative square patterns with two different spatial frequency distributions, and two realistic photographic pictures. The nonfigurative scenes were distorted with three values of each stimulus variable and the realistic scenes with four. The observers rated the similarity of all possible pairs of the nine, or 16 pictures, of each scene. Analyses of the similarity data revealed interactions between the physical variables. Physically constant noise intervals increased subjectively with increasing blur and physically constant blur intervals tended to decrease subjectively with increasing noise. The first interaction was predominant in spatially high frequency scenes, the second in spatially low frequency scenes. Spatially high frequency scenes were characterized by a rapidly varying texture and a large number of edges and the low frequency scenes by slowly varying texture, large homogeneous areas and few details. Author (ESA)

**N81-31846** Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bonn (West Germany). Inst. fuer Flugmedizin.

**ON THE APPLICATION OF A TV-MULTIPOINT X-Y TRACKER TO THE MEASUREMENT OF THE TRANSMISSIBILITY OF HUMAN VIBRATION [UEBER DIE ANWENDUNG EINES 'TV-MULTIPOINT X-Y TRACKERS' ZUR BESTIMMUNG DER SCHWINGUNGSUEBERTRAGUNG AUF DEN MENSCHEN]**

L. Vogt and E. Schwartz 1980 11 p In GERMAN  
 Avail: NTIS HC A02

A method for measuring without contact the vibrational response of parts of the human body is described. Pickup probes fixed to the body often lead to interference in the transfer function measurement. An image dissector tube together with a special scanning procedure allow the simultaneous following of three points on a moving object and to register their x and y coordinates at a 5 kHz scanning rate. The technique is applied to the complex head motion of a subject experiencing vertical vibration of 0.35 g between 2 and 19 Hz. Horizontal and vertical transmissibilities are derived and it is shown that the horizontal head motion can attain upto 75% of the vertical motion. Mechanical models for studies of readability of instruments in aircraft are sought. Author (ESA)

**N81-31847\*#** Illinois Univ., Urbana. Coordinated Science Lab.

**PILOT INTERACTION WITH AUTOMATED AIRBORNE DECISION MAKING SYSTEMS Final Report, Nov. 1975 - Aug. 1981**

William B. Rouse Aug. 1981 28 p refs  
(Grant NSG-2119)  
(NASA-CR-164729; T-106) Avail: NTIS HC A03/MF A01  
CSCL 05H

The role of the pilot and crew for future aircraft is discussed. Fifteen formal experimental studies and the development of a variety of models of human behavior based on queueing history, pattern recognition methods, control theory, fuzzy set theory, and artificial intelligence concepts are presented. L.F.M.

**N81-31848\*** National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

**RIDE QUALITY METER Patent Application**

Jack E. Leatherwood, Sherman A. Clevenson, Thomas K. Dempsey, and David G. Stephens, inventors (to NASA) Filed 22 May 1981 26 p  
(NASA-Case-LAR-12882-1; US-Patent-Appl-SN-267179) Avail: NTIS HC A03/MF A01 CSCL 05H

The invention automatically transforms vibration and noise measurements into a single number index of passenger discomfort. The noise measurements are converted into a noise discomfort value. The vibrations are converted into single axis discomfort values which are then converted into a combined axis discomfort value. The combined axis discomfort value is corrected for time duration and then summed with the noise discomfort value to obtain a total discomfort value. T.M.

**N81-31849#** Advisory Group for Aerospace Research and Development, Neuilly-Sur-Seine (France).

**PERSONAL VISUAL AIDS FOR AIRCREW**

Jun. 1981 67 p refs Partly in FRENCH and ENGLISH Presented at the AGARD Lecture Series, Paris, 22-23 Jun. 1981 and Fuerstenfeldbruck, West Germany, 25-26 Jun. 1981  
(AGARD-LS-115; ISBN-92-835-0292-2) Avail: NTIS HC A04/MF A01

The various conventional modes of optical correction required either by ametropias or by normal or pathological drops in visual acuity were reviewed. Individual brilliance enhancement systems for night flying conditions are discussed. The harmful effects, on the ocular apparatus, of various radiations are described. The means of protection against these various hazards were examined.

**N81-31850#** Service de Sante des Armees, Paris (France). Centre Principal d'Expertise Medicale du Personnel Navigant de l'Aeronautique.

**CONVENTIONAL OPTICAL CORRECTION OF AMETROPIAS IN AERONAUTICS [CORRECTION OPTIQUE CLASSIQUE DES AMETROPIES EN AERONAUTIQUE]**

P. J. Manent /In AGARD Personal Visual Aids for Aircrew Jun. 1981 4 p refs In FRENCH

Avail: NTIS HC A04/MF A01

Visual information obtained by the pilot accounts for the majority of inflight decisions and the overall safety of the flight crew. The various types of ametropias are discussed along with their frequencies of occurrence among pilots. Correctional methods are discussed and lens design is emphasized. T.M.

**N81-31851#** Service de Sante pour l'Armee de l'Air, Paris (France).

**THE INDICATIONS OF THE USE OF CONTACT LENSES IN AERONAUTICS [LES INDICATIONS DES VERRES DE CONTACT DANS LA PRATIQUE AERONAUTIQUE]**

G. F. Perdiel /In AGARD Personal Visual Aids for Aircrew Jun. 1981 4 p refs In FRENCH

Avail: NTIS HC A04/MF A01

Advances in lens design and lens fabrication are discussed. Human tolerance to long term wearing of contact lenses was examined. Examples of successful use of contact lenses in aviation and other activities in high altitude environments are presented. T.M.

**N81-31852#** Air Force Inst. of Aviation Medicine, Fuerstenfeldbruck (West Germany).

**EYE PROTECTION AND TINTED LENSES**

/In AGARD Personal Visual Aids for Aircrew Jun. 1981 6 p refs

Avail: NTIS HC A04/MF A01

The effects of ultraviolet, infrared, and visible radiation on the eye are discussed individually with specific reference to the concerns of aviation medicine. Several types of protective lenses, including glass filters, plastic filters, polarizing and polychromatic filters, and graduated filters are examined. Also the advantages and disadvantages of colored and neutral lenses are outlined. M.G.

**N81-31853#** National Defence Medical Centre, Ottawa (Ontario). Div. of Ophthalmology.

**PROBLEMS ARISING FROM THE WEARING OF HEAD EQUIPMENT**

Robert E. Forgie /In AGARD Personal Visual Aids for Aircrew Jun. 1981 7 p refs

Avail: NTIS HC A04/MF A01

The major problems associated with wearing helmets and oxygen masks are listed. Some of the methods of dealing with the non-optical problems are mentioned. The optical problems are dealt with in more detail and a review of the hypobaric chamber and human centrifuge experiments with soft contact lenses is given together with observations on the use of soft lenses in aircraft. The advantages, disadvantages, complications and limitations of soft contact lenses in military aircrew are discussed briefly with the conclusion that there is a useful if limited role for soft contact lenses in selected military aviators. Author

**N81-31854#** Royal Air Force Inst. of Aviation Medicine, Farnborough (England).

**LASERS AND PROTECTION OF THE EYES**

D. H. Brennan /In AGARD Personal Visual Aids for Aircrew Jun. 1981 13 p refs

Avail: NTIS HC A04/MF A01

The applications and characteristics of some of the lasers currently available are discussed and these parameters are related to the ocular tissues at risk. The probable visual consequences of laser induced pathology are considered together with the advantages and disadvantages of protective devices. Accident procedures, codes of conduct, and a hazard related examination protocol are also described. M.G.

**N81-31855#** Service de Sante pour l'Armee de l'Air, Paris (France). L'Armee de l'Air et du Centre d'Etudes et de Recherches de Medecine Aerospatiale.

**PROBLEMS IN AERONAUTICS POSED BY VISUAL DEFICIENCIES [PROBLEMES POSES PAR LES DEFICIENCES VISUELLES EN AERONAUTIQUE]**

J. P. Chevaleraud /In AGARD Personal Visual Aids for Aircrew Jun. 1981 5 p refs In FRENCH

Avail: NTIS HC A04/MF A01

Techniques in screening flying personnel with vision problems were reviewed. The problems that arise in eye examinations are discussed along with the anatomy of the eye. Special emphasis is placed on anatomical anomalies. T.M.

**N81-31856#** Applied Psychological Services, Wayne, Pa.

**HUMAN PERFORMANCE IN CONTINUOUS OPERATIONS: DESCRIPTION OF A SIMULATION MODEL AND USER'S MANUAL FOR EVALUATION OF PERFORMANCE DEGRADATION**

Arthur I. Siegel, J. Jay Wolf, Anna Marie Schorn, and Halim Ozkaptan (Army Research Inst., Alexandria, Va.) Army Research Inst. for the Behavioral and Social Sciences. Jan. 1981 125 p  
(Contract DAHC19-77-C-0054; DA Proj. 2Q1-6374-A-774)  
(AD-A101950; ARI-TR-505) Avail: NTIS HC A06/MF A01  
CSCL 05/8

User instructions and reference materials are presented for a computer simulation model which analyzes the PERFORMANCE Effectiveness of Combat Troops (PERFECT). The model allows analysis of anticipated performance effectiveness when variables such as continuous time in battle, light level, enemy/friendly numerical ratio, enemy/friendly terrain advantage, amount of platooning, and amount of sleep permitted are varied alone or

in combination. The model is designed for interactive operation at a terminal by a user with no or minimum sophistication in computer science or computer use. The primary output of the model is tables of personnel effectiveness degradation by day, type of combat unit, and each of five 'combat factors.' Along with interpretive guidance, step-by-step procedures are presented for the preparation of model data and for running the model.

Author (GRA)

**N81-31857#** Research Inst. of National Defence, Stockholm (Sweden).

**MAN AND MACHINE. AN ERGONOMETRIC PERSPECTIVE ON VARIOUS ABILITIES, OBJECTIVES AND WORK PATTERNS IN THE DEVELOPMENT OF THE SYSTEM [MAENNISKA OCH MASKIN. ETT ERGONOMISKT PERSPEKTIV PAA OLIKA KUNSKAPSINTRESSEN, SYFTEN OCH ARBETSMOENSTER VID SYSTEMUTVECKLING]**

Hans Furusting Oct. 1979 57 p refs In SWEDISH

(FOA-C-56020-H9) Avail: NTIS HC A04/MF A01

Ergonomics is a collective name for activities on various levels (subdisciplinary, disciplinary, or multidisciplinary). The emphasis of ergonomics may be scientific (biotechnical, psychological in technical environments), design or device oriented in a labor context, or humanistic in relation to research into workers' lifestyles and environments. This multiple interpretation, plus the existence of various disciplinary interests and the various perceptions of the role of ergonomics, contributes to competition in the development of a system. In order to discuss points of view and approaches for the development of a system, a model with the following components is introduced: (1) the perception of reality (overriding premises), (2) examples of activity, (3) aspects of viewing the issue and methodology (work patterns), and (4) scope of investigation (study objects and disciplinary interests). The model is tested by applying a few scientific traditions.

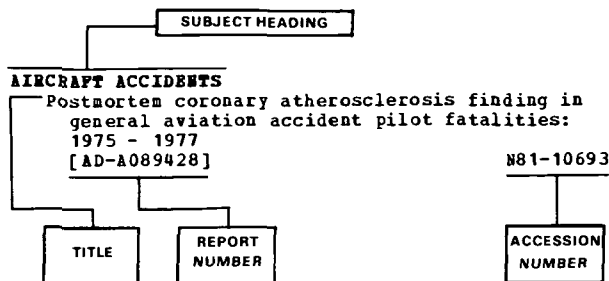
J.M.S.

# SUBJECT INDEX

AEROSPACE MEDICINE AND BIOLOGY /A Continuing Bibliography (Suppl. 226)

DECEMBER 1981

## Typical Subject Index Listing



The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of the document content, a title extension is added, separated from the title by three hyphens. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this Supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

### A-10 AIRCRAFT

Heat stress in the A-10 cockpit - Flights over desert

A81-47101

### ABNORMALITIES

Disposition of electrocardiographic abnormalities in aviation

N81-31838

### ACCELERATION STRESSES (PHYSIOLOGY)

Functional characteristics of cardiovascular system response to head-pelvis overloads

A81-44892

Modeling the effects of sustained accelerations on pilot tracking performance

N81-31839

### ACCELERATION TOLERANCE

In support of the Joint Army/Navy Air Crew Impact Injury Prevention Program

[AD-A102505] N81-31819

### ACCIDENT INVESTIGATION

Psychophysiological and other factors affecting human performance in accident prevention and investigation

A81-46324

### ACCIDENT PREVENTION

Psychophysiological and other factors affecting human performance in accident prevention and investigation

A81-46324

### ACCLIMATIZATION

Human ecological physiology. Part 2 - Human adaptation to various climato-geographical conditions --- Russian book

A81-46796

### ACOUSTIC IMPEDANCE

Comparison of Eustachian tube function measured by the microflow method and a new quantitative impedance method

A81-47106

### ADAPTIVE CONTROL

Augmented feedback in adaptive motor skill training

A81-46451

### ADRENAL METABOLISM

The functional condition of the adrenal cortex and kidneys of a healthy man during prolonged antiothostatic hypokinesia

A81-44896

### AEROEMBOLISM

Chokes - Favorable response to delayed recompression therapy: A case report

A81-47110

### AERONAUTICS

Sixth advanced operational aviation medicine course [AGARD-R-681] N81-31827

### AEROSPACE ENVIRONMENTS

Space life sciences

A81-45671

### AEROSPACE MEDICINE

Cardiac arrhythmias in space - Role of vagotonia

A81-44800

Space life sciences

A81-45671

Risk of coronary heart disease - Risk analysis in the clinical practice of aerospace medicine using a programmable calculator

A81-47111

### AGE FACTOR

Effect of aging on the electrocardiogram

A81-46525

Age-related reactions of rat bones to their unloading --- effect of simulated weightlessness

A81-47108

### AGING (BIOLOGY)

Effect of aging on the electrocardiogram

A81-46525

Effects of age, flying time and type of aircraft on the hearing of German military pilots, and its significance for inflight communication

N81-31469

### AIRCRAFT COMMUNICATION

Effects of age, flying time and type of aircraft on the hearing of German military pilots, and its significance for inflight communication

N81-31469

### AIRCRAFT CONTROL

Derivation of human pilot control laws based on literal interpretation of pilot training literature

[AIAA 81-1822] A81-44137

An improved approach to predicting pilot rating behavior

A81-46282

Aircraft control-display analysis and design using the optimal control model of the human pilot

A81-46456

### AIRCRAFT DETECTION

Modeling the effects of sustained accelerations on pilot tracking performance

N81-31839

### AIRCRAFT NOISE

Detectability and annoyance of repetitive impulsive sounds

A81-46648

Some non-auditory correlates of the hearing threshold levels of an aviation noise-exposed population

A81-47104

### AIRCRAFT PILOTS

An improved approach to predicting pilot rating behavior

A81-46282

Comparison of helicopter copilot workload while using three navigation systems during nap-of-the-earth flight

A81-46616

Effects of age, flying time and type of aircraft on the hearing of German military pilots, and its significance for inflight communication

N81-31469

Hearing impaired aviators in the U.S. Army

N81-31471

Pilot interaction with automated airborne decision making systems

[NASA-CR-164729] N81-31847



## ALCOHOLS

- Potential health and safety impacts from distribution storage alcohol fuels  
[ANL/CNSV/TM-61] N81-30789
- ALIPHATIC COMPOUNDS**  
Volume reduction of solid waste by biological conversion of cellulose  
[ORNL/TM-7653] N81-30791
- ALPHA PARTICLES**  
Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model  
[CONF-800944-7] N81-31823
- ALTITUDE ACCLIMATIZATION**  
Physiological mechanisms for the adaptation of the respiratory regulation system to acute high-altitude hypoxia  
N81-44890
- AMINO ACIDS**  
Amino acids of the Murchison meteorite. I - Six carbon acyclic primary alpha-amino alkanic acids  
N81-45495  
Reasons for the occurrence of the twenty coded protein amino acids  
N81-45496
- ANABROBES**  
Volume reduction of solid waste by biological conversion of cellulose  
[ORNL/TM-7653] N81-30791
- ANALOGIES**  
Similarity of distorted pictures: On the interaction between edge blur and random noise --- psychophysics  
[FOA-C-53004-H9] N81-31845
- ANGINA PECTORIS**  
Prevention of cardiovascular diseases  
N81-31836
- ANGIOGRAPHY**  
Measurement of normal left atrial function with gated radionuclide angiography  
N81-46523
- ANOMALIES**  
Principal electrocardiographic anomalies in the valuation of navigation personnel  
N81-31832
- ARCHITECTURE**  
Criteria for recommending lighting levels  
[PB81-185126] N81-30798
- ARM (ANATOMY)**  
The influence of arm work in the antiorthostatic position on indicators of left ventricle activity  
N81-44894  
Active muscle force and moment response of the human arm and shoulder  
N81-47103
- ARRHYTHMIA**  
Cardiac arrhythmias in space - Role of vagotonia  
N81-44800  
Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure  
N81-44859  
Cardiovascular problems during the pilots career  
N81-31837
- ASBESTOS**  
A statistical investigation of the pulmonary effects of exposure of asbestos  
N81-31817
- AUDIOMETRY**  
The effect of noise on the vestibular system  
N81-31455  
Hearing conservation  
N81-31472
- AUDITORY DEFECTS**  
Some non-auditory correlates of the hearing threshold levels of an aviation noise-exposed population  
N81-47104  
The effect of noise on the vestibular system  
N81-31455  
Effects of age, flying time and type of aircraft on the hearing of German military pilots, and its significance for inflight communication  
N81-31469  
Hearing impaired aviators in the U.S. Army  
N81-31471
- AUDITORY PERCEPTION**  
Detectability and annoyance of repetitive impulsive sounds  
N81-46648

## AUDITORY SIGNALS

- Assessing the effectiveness of auditory warnings  
N81-31457

## AUSTRALIA

- Records of Australian fouling organisms: Sessile barnacles (crustacea, cirripedia)  
[MRL-R-809] N81-31809

## AUTOMATIC CONTROL

- Pilot interaction with automated airborne decision making systems  
[NASA-CR-164729] N81-31847

## AUTOMATION

- A three roll wrist robot  
[SME PAPER MS80-699] N81-45666

## AXONS

- One way traffic of pulses in a neuron --- axon shape effects  
[MC-TW-213/81] N81-30796

## B

## BACILLUS

- Response of bacillus subtilis spores to heavy ion irradiation using cellulose nitrate detectors  
N81-30792

## BACTERIA

- Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction  
N81-30787

- Novel approach to the growth of anaerobic microorganisms  
[CONF-810554-1] N81-30790

## BACTERIOLOGY

- Novel approach to the growth of anaerobic microorganisms  
[CONF-810554-1] N81-30790

## BACTERIOPHAGES

- Membrane-membrane interactions in a lipid-containing bacteriophage system  
[DOE/EV-03211/32] N81-31813

## BED REST

- The functional condition of the adrenal cortex and kidneys of a healthy man during prolonged antiorthostatic hypokinesia  
N81-44896

- The regulation of calcium exchange under conditions of prolonged antiorthostatic hypokinesia  
N81-44897

## BEHAVIOR

- The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance  
N81-47105

## BIBLIOGRAPHIES

- Touch-sensing technology - A review  
[SME PAPER MSR80-03,] N81-44651

## BIOASSAY

- Biochemical assays of cultured cells --- space shuttle oft-3  
[NASA-CR-161079] N81-30788  
Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin  
[CONF-800323-4] N81-30793

## BIOASTRONAUTICS

- A closed ecosystem for space colonies  
N81-44037  
Space life sciences  
N81-45671

## BIOCHEMISTRY

- Biochemical assays of cultured cells --- space shuttle oft-3  
[NASA-CR-161079] N81-30788  
Biochemical chromophores and the interstellar extinction at ultraviolet wavelengths  
N81-30800  
Radiation biophysics research  
[LBL-11700] N81-31811

## BIOCONTROL SYSTEMS

- Is the central control of temperature stability the paradigm of homeostasis /Discussion of theories and evidence/  
N81-44175  
The regulation of cardiovascular system activity during transient thermal stress  
N81-44893

**BIOCONVERSION**

Volume reduction of solid waste by biological conversion of cellulose  
[ORNL/TM-7653] N81-30791

**BIODYNAMICS**

Active muscle force and moment response of the human arm and shoulder A81-47103

**BIOELECTRIC POTENTIAL**

One way traffic of pulses in a neuron --- axon shape effects  
[MC-TW-213/81] N81-30796

**BIOGEOCHEMISTRY**

The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico A81-44066

**BIOINSTRUMENTATION**

Measurement of normal left atrial function with gated radionuclide angiography A81-46523

**BIOLOGICAL EFFECTS**

The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance A81-47105

Age-related reactions of rat bones to their unloading --- effect of simulated weightlessness A81-47108

Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin [CONF-800323-4] N81-30793

Repair and cell cycle response in cells exposed to environmental biohazards [DOE/EV-04568/T1] N81-31814

Biological effects of ionizing radiation at the molecular, cellular, and organismal levels [DOE/EV-10503/1] N81-31815

**BIOLOGICAL EVOLUTION**

Amino acids of the Murchison meteorite. I - Six carbon acyclic primary alpha-amino alkanolic acids A81-45495

Reasons for the occurrence of the twenty coded protein amino acids A81-45496

**BIOMAGNETISM**

The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance A81-47105

**BIOMEDICAL DATA**

Effect of aging on the electrocardiogram A81-46525

**BIONICS**

Proceedings of NBS/Air Force ICAM workshop on robot interfaces [SME PAPER MSR80-06] A81-45664

**BIOPHYSICS**

Radiation biophysics research [LBL-11700] N81-31811

In support of the Joint Army/Navy Air Crew Impact Injury Prevention Program [AD-A102505] N81-31819

**BIOREACTORS**

Volume reduction of solid waste by biological conversion of cellulose [ORNL/TM-7653] N81-30791

Biological reduction of nitrate wastewater using fluidized-bed bioreactors [CONF-810554-2] N81-31812

**BLOOD CIRCULATION**

The regulation of cardiovascular system activity during transient thermal stress A81-44893

The influence of arm work in the antiorthostatic position on indicators of left ventricle activity A81-44894

**BLOOD PLASMA**

Exercise training hypotension - Implications for plasma volume, renin, and vasopressin A81-45176

**BLOOD PRESSURE**

Exercise training hypotension - Implications for plasma volume, renin, and vasopressin A81-45176

**BLOOD VOLUME**

Measurement of normal left atrial function with gated radionuclide angiography A81-46523

**BLURRING**

Similarity of distorted pictures: On the interaction between edge blur and random noise --- psychophysics [POA-C-53004-H9] N81-31845

**BODY TEMPERATURE**

Thermal and glycemic responses during mild exercise in +5 to -15 C environments following alcohol ingestion A81-47102

Comparison between the heat loss and heat gain through the lungs and body surface during hypothermia and its treatment [DRIC-T-6307] N81-31825

**BONE DEMINERALIZATION**

Age-related reactions of rat bones to their unloading --- effect of simulated weightlessness A81-47108

**BONE MARROW**

Effect of X-rays on the bone marrow cells of white mice under conditions of hypoxia A81-46825

**BRAIN**

The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance A81-47105

**BRIGHTNESS**

Criteria for recommending lighting levels [PB81-185126] N81-30798

**C****CALCIUM METABOLISM**

The regulation of calcium exchange under conditions of prolonged antiorthostatic hypokinesia A81-44897

**CALIBRATING**

The effects of gender and instructions on calibration [AD-A102255] N81-31844

**CANCER**

A statistical investigation of the pulmonary effects of exposure of asbestos N81-31817

Toward a theory of the initiation of cancer by ionizing radiation: Track structure analysis for electrons and alpha particles in water [CONF-800944-8] N81-31821

Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model [CONF-800944-7] N81-31823

**CARBON ISOTOPES**

The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico A81-44066

**CARBON MONOXIDE**

Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure A81-44859

**CARBONACEOUS METEORITES**

Amino acids of the Murchison meteorite. I - Six carbon acyclic primary alpha-amino alkanolic acids A81-45495

**CARCINOGENS**

Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin [CONF-800323-4] N81-30793

Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model [CONF-800944-7] N81-31823

**CARDIAC AURICLES**

Measurement of normal left atrial function with gated radionuclide angiography A81-46523

**CARDIAC VENTRICLES**

The influence of arm work in the antiorthostatic position on indicators of left ventricle activity A81-44894

# CARDIOGRAMS

# SUBJECT INDEX

## CARDIOGRAMS

The application of cardiograms in the valuation of navigation personnel  
N81-31830

## CARDIOGRAPHY

Sixth advanced operational aviation medicine course [AGARD-R-681] N81-31827  
NATO regulations on the cardio-vascular system N81-31829  
Treadmill testing for the detection of asymptomatic coronary disease in the healthy male N81-31833

## CARDIOLOGY

Sixth advanced operational aviation medicine course [AGARD-R-681] N81-31827

## CARDIOVASCULAR SYSTEM

Cardiac arrhythmias in space - Role of vagotonia A81-44800  
Functional characteristics of cardiovascular system response to head-pelvis overloads A81-44892  
The regulation of cardiovascular system activity during transient thermal stress A81-44893  
The Wolff-Parkinson-White pattern in healthy aircrew --- heart disease diagnostics A81-47109  
NATO regulations on the cardio-vascular system N81-31829

## CATHODE RAY TUBES

An evaluation of radiation emission from video display terminals [PB81-198483] N81-31826

## CELL DIVISION

Repair and cell cycle response in cells exposed to environmental biohazards [DOE/EV-04568/T1] N81-31814

## CELLS (BIOLOGY)

An in vitro system for assessing lung cell response to ozone A81-46939  
Biochemical assays of cultured cells --- space shuttle oft-3 [NASA-CR-161079] N81-30788  
Membrane-membrane interactions in a lipid-containing bacteriophage system [DOE/EV-03211/32] N81-31813

## CELLULOSE NITRATE

Response of bacillus subtilis spores to heavy ion irradiation using cellulose nitrate detectors N81-30792

## CENTRAL NERVOUS SYSTEM

Is the central control of temperature stability the paradigm of homeostasis /Discussion of theories and evidence/ A81-44175

## CEREBRAL CORTEX

Neuronal adaptive mechanisms underlying intelligent information processing [AD-A101908] N81-31843

## CHEMICAL ANALYSIS

Metabolism of hydrazine [AD-A101849] N81-31818

## CHEMICAL EVOLUTION

Amino acids of the Murchison meteorite. I - Six carbon acyclic primary alpha-amino alkanolic acids A81-45495  
Reasons for the occurrence of the twenty coded protein amino acids A81-45496  
Cyanamide mediated syntheses of peptides containing histidine and hydrophobic amino acids A81-45497

## CHEMICAL EXPLOSIONS

Potential health and safety impacts from distribution storage alcohol fuels [ANL/CNSV/TM-61] N81-30789

## CHROMOSOMES

Effect of X-rays on the bone marrow cells of white mice under conditions of hypoxia A81-46825

## CLIMATOLOGY

Human ecological physiology. Part 2 - Human adaptation to various climato-geographical conditions --- Russian book A81-46796

## CLINICAL MEDICINE

Digital image processing of two dimensional echocardiograms - Identification of the endocardium A81-46524  
Radiation biophysics research [LBL-11700] N81-31811

## CLOSED ECOLOGICAL SYSTEMS

A closed ecosystem for space colonies A81-44037

## COCKPITS

Heat stress in the A-10 cockpit - Flights over desert A81-47101

## COLD ACCLIMATIZATION

Human adaptation mechanisms under high-latitude conditions --- Russian book A81-46791

## COLONIES

A closed ecosystem for space colonies A81-44037

## COMBAT

Human performance in continuous operations: Description of a simulation model and user's manual for evaluation of performance degradation [AD-A101950] N81-31856

## COMFORT

Ride quality meter [NASA-CASE-LAR-12882-1] N81-31848

## COMPUTER PROGRAMS

Risk of coronary heart disease - Risk analysis in the clinical practice of aerospace medicine using a programmable calculator A81-47111

## CONDITIONING (LEARNING)

The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance A81-47105  
Neuronal adaptive mechanisms underlying intelligent information processing [AD-A101908] N81-31843

## CONTACT LENSES

The indications of the use of contact lenses in aeronautics N81-31851

## CONTROL EQUIPMENT

Proceedings of NBS/Air Force ICAM workshop on robot interfaces [SME PAPER MSR80-06] A81-45664

## CONTROL SIMULATION

Modeling the human controller in environments that include continuous and discrete tasks A81-46453  
Aircraft control-display analysis and design using the optimal control model of the human pilot A81-46456

## CONTROL STABILITY

An improved approach to predicting pilot rating behavior A81-46282

## CONTROL THEORY

Pilot interaction with automated airborne decision making systems [NASA-CR-164729] N81-31847

## CORONARY ARTERY DISEASE

Risk of coronary heart disease - Risk analysis in the clinical practice of aerospace medicine using a programmable calculator A81-47111

Sixth advanced operational aviation medicine course [AGARD-R-681] N81-31827  
Non-invasive evaluation of the coronary circulation N81-31828

Treadmill testing for the detection of asymptomatic coronary disease in the healthy male N81-31833

Epidemiological basis for the prevention of coronary heart disease N81-31835

Prevention of cardiovascular diseases N81-31836

## CORONARY CIRCULATION

Non-invasive evaluation of the coronary circulation N81-31828

## CYANAMIDES

Cyanamide mediated syntheses of peptides containing histidine and hydrophobic amino acids A81-45497

## CYTOLOGY

- Biochemical assays of cultured cells --- space shuttle oft-3  
[NASA-CR-161079] N81-30788

## D

## DATA RECORDING

- Continuous recording of the ECG according to the Holter method N81-31834

## DEACTIVATION

- Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction N81-30787

## DECISION MAKING

- Pilot interaction with automated airborne decision making systems  
[NASA-CR-164729] N81-31847

## DECOMPRESSION SICKNESS

- Chokes - Favorable response to delayed recompression therapy: A case report A81-47110

## DENITROGENATION

- Biological reduction of nitrate wastewater using fluidized-bed bioreactors  
[CONF-810554-2] N81-31812

## DEOXYRIBONUCLEIC ACID

- Radiation biophysics research  
[LBL-11700] N81-31811  
Repair and cell cycle response in cells exposed to environmental biohazards  
[DOE/EV-04568/T1] N81-31814

## DESERTS

- Heat stress in the A-10 cockpit - Flights over desert A81-47101

## DIAGNOSIS

- The Wolff-Parkinson-White pattern in healthy aircrew --- heart disease diagnostics A81-47109  
Non-invasive evaluation of the coronary circulation N81-31828  
Treadmill testing for the detection of asymptomatic coronary disease in the healthy male N81-31833  
Continuous recording of the ECG according to the Holter method N81-31834  
Disposition of electrocardiographic abnormalities in aviation N81-31838

## DIGITAL TECHNIQUES

- Digital image processing of two dimensional echocardiograms - Identification of the endocardium A81-46524

## DISPLAY DEVICES

- Aircraft control-display analysis and design using the optimal control model of the human pilot A81-46456  
Video terminals and informational interaction /Engineering and psychological aspects/ --- Russian book A81-46923  
An evaluation of radiation emission from video display terminals  
[PB81-198483] N81-31826

## DISTORTION

- Similarity of distorted pictures: On the interaction between edge blur and random noise --- psychophysics  
[FOA-C-53004-H9] N81-31845

## DIVING (UNDERWATER)

- Chokes - Favorable response to delayed recompression therapy: A case report A81-47110

## E

## ECHOCARDIOGRAPHY

- Digital image processing of two dimensional echocardiograms - Identification of the endocardium A81-46524  
Echocardiography in aviation medicine N81-31831

## ECOLOGY

- Human ecological physiology. Part 2 - Human adaptation to various climato-geographical conditions --- Russian book A81-46796

## ECOSYSTEMS

- The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico A81-44066

## EJECTION INJURIES

- Active muscle force and moment response of the human arm and shoulder A81-47103

## ELECTRIC POWER PLANTS

- Assessment of the use of human factors in the design of fossil-fired steam-generating systems [EPRI-CS-1760] N81-30799

## ELECTRIC PULSES

- Heteroclinic waves of the Fitzhugh-Nagumo equations --- nerve impulse propagation [MC-TW-209/80] N81-30795  
One way traffic of pulses in a neuron --- axon shape effects [MC-TW-213/81] N81-30796

## ELECTROCARDIOGRAPHY

- Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure A81-44859  
Effect of aging on the electrocardiogram A81-46525  
The Wolff-Parkinson-White pattern in healthy aircrew --- heart disease diagnostics A81-47109  
In support of the Joint Army/Navy Air Crew Impact Injury Prevention Program [AD-A102505] N81-31819  
The application of cardiograms in the valuation of navigation personnel N81-31830  
Principal electrocardiographic anomalies in the valuation of navigation personnel N81-31832  
Continuous recording of the ECG according to the Holter method N81-31834  
Disposition of electrocardiographic abnormalities in aviation N81-31838

## ELECTROMYOGRAPHY

- Quantification through the surface EMG of muscle fatigue and recovery during successive isometric contractions A81-47107

## ELECTRONS

- Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model [CONF-800944-7] N81-31823

## ENDOCRINE SYSTEMS

- Cardiac arrhythmias in space - Role of vagotonia A81-44800  
Repair and cell cycle response in cells exposed to environmental biohazards [DOE/EV-04568/T1] N81-31814

## ENERGY TECHNOLOGY

- Doing a risk analysis [CONF-810480-1] N81-31822

## ENVIRONMENTAL QUALITY

- Records of Australian fouling organisms: Sessile barnacles (crustacea, cirripedia) [NRL-R-809] N81-31809

## ENVIRONMENTAL TESTS

- An in vitro system for assessing lung cell response to ozone A81-46939

## ENZYME ACTIVITY

- Exercise training hypotension - Implications for plasma volume, renin, and vasopressin A81-45176  
Biochemical assays of cultured cells --- space shuttle oft-3 [NASA-CR-161079] N81-30788

## EPIDEMIOLOGY

- Epidemiological basis for the prevention of coronary heart disease N81-31835  
Prevention of cardiovascular diseases N81-31836

**ESCHERICHIA**

Novel approach to the growth of anaerobic  
microorganisms  
[CONF-810554-1] N81-30790

**ETHYL ALCOHOL**

Thermal and glycemic responses during mild  
exercise in +5 to -15 C environments following  
alcohol ingestion  
A81-47102

**EUSTACHIAN TUBES**

Comparison of Eustachian tube function measured by  
the microflow method and a new quantitative  
impedance method  
A81-47106

**EXERCISE PHYSIOLOGY**

Quantification through the surface EMG of muscle  
fatigue and recovery during successive isometric  
contractions  
A81-47107

**EXHAUST GASES**

Tumorigenesis of diesel exhaust, gasoline exhaust,  
and related emission extracts on SENCAR mouse skin  
[CONF-800323-4] N81-30793

**EXOBIOLOGY**

Life sciences flight experiments program - Overview  
A81-44386  
Amino acids of the Murchison meteorite. I - Six  
carbon acyclic primary alpha-amino alkanic acids  
A81-45495  
Space life sciences  
A81-45671

Biochemical chromophores and the interstellar  
extinction at ultraviolet wavelengths  
N81-30800

**EXPOSURE**

A statistical investigation of the pulmonary  
effects of exposure of asbestos  
N81-31817

**EXTRATERRESTRIAL INTELLIGENCE**

The SETI program plan and instrument development  
status  
N81-31074

**EXTRATERRESTRIAL LIFE**

Biochemical chromophores and the interstellar  
extinction at ultraviolet wavelengths  
N81-30800

**EYE (ANATOMY)**

Problems in aeronautics posed by visual deficiencies  
N81-31855

**EYE EXAMINATIONS**

Problems in aeronautics posed by visual deficiencies  
N81-31855

**EYE MOVEMENTS**

Exterspecific component of the motion parallax  
field  
A81-44270  
Perceived direction of motion under retinal image  
stabilization  
A81-46199

Comparison of helicopter copilot workload while  
using three navigation systems during  
nap-of-the-earth flight  
A81-46616

Dynamics of two-dimensional eye-head tracking  
[AD-A102369] N81-31842

**EYE PROTECTION**

Personal visual aids for aircrew  
[AGARD-LS-115] N81-31849  
Eye protection and tinted lenses  
N81-31852  
Lasers and protection of the eyes  
N81-31854

**EYEPieces**

Conventional optical correction of ametropias in  
aeronautics  
N81-31850  
The indications of the use of contact lenses in  
aeronautics  
N81-31851

**F****FACTOR ANALYSIS**

The effects of gender and instructions on  
calibration  
[AD-A102255] N81-31844

**FAST NEUTRONS**

Aircrew shielding to fast neutrons from nuclear  
detonations  
[AD-A102239] N81-31820

**FEASIBILITY ANALYSIS**

A closed ecosystem for space colonies  
A81-44037

**FECES**

The carbon isotope biogeochemistry of the  
individual hydrocarbons in bat guano and the  
ecology of the insectivorous bats in the region  
of Carlsbad, New Mexico  
A81-44066

**FEEDBACK CONTROL**

Derivation of human pilot control laws based on  
literal interpretation of pilot training  
literature  
[AIAA 81-1822] A81-44137

**FEMALES**

The effects of gender and instructions on  
calibration  
[AD-A102255] N81-31844

**FIBRILLATION**

Principal electrocardiographic anomalies in the  
valuation of navigation personnel  
N81-31832  
Continuous recording of the ECG according to the  
Holter method  
N81-31834

**FLIGHT CONTROL**

Derivation of human pilot control laws based on  
literal interpretation of pilot training  
literature  
[AIAA 81-1822] A81-44137

**FLIGHT CREWS**

Heat stress in the A-10 cockpit - Flights over  
desert  
A81-47101  
The Wolff-Parkinson-White pattern in healthy aircrew  
--- heart disease diagnostics  
A81-47109  
Hearing standards for aircrew  
N81-31461  
Training for relaxation. An experiment at the  
military flight school  
[FOA-C-59003-H9] N81-31841  
Personal visual aids for aircrew  
[AGARD-LS-115] N81-31849  
Eye protection and tinted lenses  
N81-31852  
Problems arising from the wearing of head equipment  
N81-31853  
Lasers and protection of the eyes  
N81-31854

**FLIGHT FITNESS**

Comparison of Eustachian tube function measured by  
the microflow method and a new quantitative  
impedance method  
A81-47106  
Risk of coronary heart disease - Risk analysis in  
the clinical practice of aerospace medicine  
using a programmable calculator  
A81-47111  
Non-invasive evaluation of the coronary circulation  
N81-31828  
NATO regulations on the cardio-vascular system  
N81-31829  
The application of cardiograms in the valuation of  
navigation personnel  
N81-31830  
Principal electrocardiographic anomalies in the  
valuation of navigation personnel  
N81-31832

**FLIGHT SAFETY**

Hearing impaired aviators in the U.S. Army  
N81-31471

**FLIGHT STRESS (BIOLOGY)**

Comparison of helicopter copilot workload while  
using three navigation systems during  
nap-of-the-earth flight  
A81-46616  
Heat stress in the A-10 cockpit - Flights over  
desert  
A81-47101

**FLIGHT TRAINING**

Training for relaxation. An experiment at the  
military flight school  
[FOA-C-59003-H9] N81-31841

## FLYING PERSONNEL

- Sirth advanced operational aviation medicine course  
[AGARD-R-681] N81-31827
- Non-invasive evaluation of the coronary circulation  
N81-31828
- NATO regulations on the cardio-vascular system  
N81-31829
- The application of cardiograms in the valuation of  
navigation personnel N81-31830
- Echocardiography in aviation medicine N81-31831
- Principal electrocardiographic anomalies in the  
valuation of navigation personnel N81-31832
- Treadmill testing for the detection of  
asymptomatic coronary disease in the healthy male  
N81-31833
- Disposition of electrocardiographic abnormalities  
in aviation N81-31838
- Conventional optical correction of ametropias in  
aeronautics N81-31850
- The indications of the use of contact lenses in  
aeronautics N81-31851
- Problems in aeronautics posed by visual deficiencies  
N81-31855

## FOULING

- Records of Australian fouling organisms: Sessile  
barnacles (crustacea, cirripedia)  
[NRL-R-809] N81-31809

## G

## GENETIC CODE

- Reasons for the occurrence of the twenty coded  
protein amino acids N81-45496
- Synthesis of oligoguanylates on oligocytidylate  
templates --- on primitive earth N81-45498
- Condensation of activated diguanylates on a  
Poly/C/ template --- prebiotic polynucleotide  
replication mechanism N81-45499

## GLUCOSE

- Thermal and glyceimic responses during mild  
exercise in +5 to -15 C environments following  
alcohol ingestion N81-47102

## H

## HAZARDS

- The effect of noise on the vestibular system  
N81-31455
- Hearing conservation N81-31472

## HEAD (ANATOMY)

- Functional characteristics of cardiovascular  
system response to head-pelvis overloads N81-44892
- Dynamics of two-dimensional eye-head tracking  
[AD-A102369] N81-31842

## HEALTH PHYSICS

- Potential health and safety impacts from  
distribution storage alcohol fuels  
[ANL/CNSV/TM-61] N81-30789
- Health effects of low-level radiation  
[CONF-810606-47] N81-31824

## HEARING

- Some non-auditory correlates of the hearing  
threshold levels of an aviation noise-exposed  
population N81-47104
- Hearing standards for aircrew N81-31461
- Effects of age, flying time and type of aircraft  
on the hearing of German military pilots, and  
its significance for inflight communication  
N81-31469

## HEART

- Digital image processing of two dimensional  
echocardiograms - Identification of the  
endocardium N81-46524

## HEART DISEASES

- Cardiac arrhythmias in space - Role of vagotonia  
N81-44800
- Respiratory muscle fatigue during cardiogenic shock  
N81-45177
- The Wolff-Parkinson-White pattern in healthy aircrew  
--- heart disease diagnostics N81-47109
- Prevention of cardiovascular diseases N81-31836
- Cardiovascular problems during the pilots career  
N81-31837

## HEART FUNCTION

- The influence of arm work in the antiorthostatic  
position on indicators of left ventricle activity  
N81-44894
- Measurement of normal left atrial function with  
gated radionuclide angiography N81-46523
- Echocardiography in aviation medicine N81-31831
- Principal electrocardiographic anomalies in the  
valuation of navigation personnel N81-31832

## HEAT ACCLIMATIZATION

- The relative characteristics of continuous and  
intermittent adaptation to high temperatures  
N81-44891
- The regulation of cardiovascular system activity  
during transient thermal stress N81-44893

## HEAT TOLERANCE

- Heat stress in the A-10 cockpit - Flights over  
desert N81-47101

## HEAT TRANSFER

- Thermal and glyceimic responses during mild  
exercise in +5 to -15 C environments following  
alcohol ingestion N81-47102

## HEATING

- Comparison between the heat loss and heat gain  
through the lungs and body surface during  
hypothermia and its treatment  
[DRIC-T-6307] N81-31825

## HEAVY IONS

- Effects of accelerated heavy ions on bacillus  
subtilis spores: Inactivation, repair and  
mutation induction N81-30787
- Response of bacillus subtilis spores to heavy ion  
irradiation using cellulose nitrate detectors  
N81-30792

## HELMETS

- Problems arising from the wearing of head equipment  
N81-31853

## HEMATOLOGY

- Metabolism of hydrazine  
[AD-A101849] N81-31818

## HEMODYNAMIC RESPONSES

- Functional characteristics of cardiovascular  
system response to head-pelvis overloads N81-44892
- The regulation of cardiovascular system activity  
during transient thermal stress N81-44893
- The influence of lower body negative pressure  
tests on peripheral hemodynamics indicators  
N81-44895

## HIGH ALTITUDE BREATHING

- Physiological mechanisms for the adaptation of the  
respiratory regulation system to acute  
high-altitude hypoxia N81-44890

## HIGH PRESSURE OXYGEN

- The instruction of student pilots in breathing and  
speaking at excess oxygen pressures N81-44475

## HIGH TEMPERATURE ENVIRONMENTS

- The relative characteristics of continuous and  
intermittent adaptation to high temperatures  
N81-44891
- The regulation of cardiovascular system activity  
during transient thermal stress N81-44893

## HISTIDINE

- Cyanamide mediated syntheses of peptides  
containing histidine and hydrophobic amino acids  
N81-45497

## HOMEOSTASIS

Is the central control of temperature stability  
the paradigm of homeostasis /Discussion of  
theories and evidence/

A81-44175

## HORMONE METABOLISMS

Exercise training hypotension - Implications for  
plasma volume, renin, and vasopressin

A81-45176

## HUMAN BEHAVIOR

Neuronal adaptive mechanisms underlying  
intelligent information processing  
[AD-A101908]

N81-31843

## HUMAN FACTORS ENGINEERING

Biorhythms and work --- Russian book

A81-46795

Video terminals and informational interaction  
/Engineering and psychological aspects/ ---  
Russian book

A81-46923

A microcomputer based facility for psychoacoustic  
experimentation --- human factors engineering,  
warning systems

N81-30797

Criteria for recommending lighting levels

N81-30798

Assessment of the use of human factors in the  
design of fossil-fired steam-generating systems  
[EPRI-CS-1760]

N81-30799

On the application of a TV-multipoint x-y tracker  
to the measurement of the transmissibility of  
human vibration --- a mechanical impedance model

N81-31846

Eye protection and tinted lenses

N81-31852

Problems arising from the wearing of head equipment

N81-31853

Lasers and protection of the eyes

N81-31854

Human performance in continuous operations:  
Description of a simulation model and user's  
manual for evaluation of performance degradation  
[AD-A101950]

N81-31856

Man and machine. An ergonomic perspective on  
various abilities, objectives and work patterns  
in the development of the system

N81-31857

## HUMAN PERFORMANCE

Psychophysiological and other factors affecting  
human performance in accident prevention and  
investigation

A81-46324

Biorhythms and work --- Russian book

A81-46795

In support of the Joint Army/Navy Air Crew Impact  
Injury Prevention Program  
[AD-A102505]

N81-31819

The effects of gender and instructions on  
calibration  
[AD-A102255]

N81-31844

Human performance in continuous operations:  
Description of a simulation model and user's  
manual for evaluation of performance degradation  
[AD-A101950]

N81-31856

## HUMAN REACTIONS

Human ecological physiology. Part 2 - Human  
adaptation to various climato-geographical  
conditions --- Russian book

A81-46796

## HUMAN TOLERANCES

The relative characteristics of continuous and  
intermittent adaptation to high temperatures

A81-44891

Human adaptation mechanisms under high-latitude  
conditions --- Russian book

A81-46791

Active muscle force and moment response of the  
human arm and shoulder

A81-47103

Quantification through the surface EMG of muscle  
fatigue and recovery during successive isometric  
contractions

A81-47107

## HYDRAZINE NITRATE

Metabolism of hydrazine  
[AD-A101849]

N81-31818

## HYDROCARBONS

The carbon isotope biogeochemistry of the  
individual hydrocarbons in bat guano and the  
ecology of the insectivorous bats in the region  
of Carlsbad, New Mexico

A81-44066

## HYDROXYL COMPOUNDS

Potential health and safety impacts from  
distribution storage alcohol fuels  
[ANL/CHSV/TM-61]

N81-30789

## HYPERTENSION

Cardiovascular problems during the pilots career

N81-31837

## HYPOKINESIA

The functional condition of the adrenal cortex and  
kidneys of a healthy man during prolonged  
antiorthostatic hypokinesia

A81-44896

The regulation of calcium exchange under  
conditions of prolonged antiorthostatic  
hypokinesia

A81-44897

## HYPOTENSION

Exercise training hypotension - Implications for  
plasma volume, renin, and vasopressin

A81-45176

## HYPOTHERMIA

Comparison between the heat loss and heat gain  
through the lungs and body surface during  
hypothermia and its treatment  
[DRIC-T-6307]

N81-31825

## HYPOXIA

Physiological mechanisms for the adaptation of the  
respiratory regulation system to acute  
high-altitude hypoxia

A81-44890

Effect of X-rays on the bone marrow cells of white  
mice under conditions of hypoxia

A81-46825

## ILLUMINATING

Criteria for recommending lighting levels  
[PB81-185126]

N81-30798

## IMAGE DISSECTOR TUBES

On the application of a TV-multipoint x-y tracker  
to the measurement of the transmissibility of  
human vibration --- a mechanical impedance model

N81-31846

## IMAGE PROCESSING

Digital image processing of two dimensional  
echocardiograms - Identification of the  
endocardium

A81-46524

## IMAGES

Similarity of distorted pictures: On the  
interaction between edge blur and random noise  
--- psychophysics  
[FOA-C-53004-H9]

N81-31845

## IMPACT ACCELERATION

In support of the Joint Army/Navy Air Crew Impact  
Injury Prevention Program  
[AD-A102505]

N81-31819

## IMPEDANCE MEASUREMENTS

Comparison of Eustachian tube function measured by  
the microflow method and a new quantitative  
impedance method

A81-47106

## INDUSTRIAL SAFETY

Psychophysiological and other factors affecting  
human performance in accident prevention and  
investigation

A81-46324

Hearing conservation

N81-31472

## INFORMATION SYSTEMS

Video terminals and informational interaction  
/Engineering and psychological aspects/ ---  
Russian book

A81-46923

## INTERFACES

Proceedings of NBS/Air Force ICAM workshop on  
robot interfaces  
[SME PAPER MSR80-06]

A81-45664

## INTERSTELLAR MATTER

Biochemical chromophores and the interstellar  
extinction at ultraviolet wavelengths

N81-30800



## ION BEAMS

Radiation biophysics research  
[LBL-11700] N81-31811

## ION IRRADIATION

Response of bacillus subtilis spores to heavy ion  
irradiation using cellulose nitrate detectors N81-30792

## IONIZING RADIATION

Biological effects of ionizing radiation at the  
molecular, cellular, and organismal levels  
[DOE/EV-10503/1] N81-31815  
Toward a theory of the initiation of cancer by  
ionizing radiation: Track structure analysis  
for electrons and alpha particles in water  
[CONF-800944-8] N81-31821  
Toward a theory of the initiation of cancer by  
ionizing radiation. The twin doublet pair model  
[CONF-800944-7] N81-31823  
An evaluation of radiation emission from video  
display terminals  
[PB81-198483] N81-31826

## K

## KIDNEYS

The functional condition of the adrenal cortex and  
kidneys of a healthy man during prolonged  
antiorthostatic hypokinesia A81-44896

## L

## LASER APPLICATIONS

Experimental investigations and new  
instrumentation for Nd:YAG laser treatment in  
urology  
[MBB-UA-517/79-OE] N81-30794

## LASER DAMAGE

Lasers and protection of the eyes N81-31854

## LASERS

Lasers and protection of the eyes N81-31854

## LENS DESIGN

Personal visual aids for aircrew  
[AGARD-LS-115] N81-31849  
Conventional optical correction of ametropias in  
aeronautics N81-31850  
The indications of the use of contact lenses in  
aeronautics N81-31851

## LENSES

Eye protection and tinted lenses N81-31852

## LIFE SCIENCES

Life sciences flight experiments program - Overview  
A81-44386  
Space life sciences A81-45671

## LIGHT SOURCES

Criteria for recommending lighting levels  
[PB81-185126] N81-30798

## LIGHTING EQUIPMENT

Criteria for recommending lighting levels  
[PB81-185126] N81-30798

## LIMBS (ANATOMY)

The influence of lower body negative pressure  
tests on peripheral hemodynamics indicators A81-44895

## LINEAR ENERGY TRANSFER (LET)

Health effects of low-level radiation  
[CONF-810606-47] N81-31824

## LOW PRESSURE

The influence of lower body negative pressure  
tests on peripheral hemodynamics indicators A81-44895

## LOW TEMPERATURE ENVIRONMENTS

Thermal and glyceic responses during mild  
exercise in +5 to -15 C environments following  
alcohol ingestion A81-47102

## LUNGS

An in vitro system for assessing lung cell  
response to ozone A81-46939  
Chokes - Favorable response to delayed  
recompression therapy: A case report A81-47110

Comparison between the heat loss and heat gain  
through the lungs and body surface during  
hypothermia and its treatment N81-31825  
[DRIC-T-6307]

## M

## MAGNETIC EFFECTS

The effect of a constant and uniform magnetic  
field on mouse brain - A study by magnetic  
nuclear resonance A81-47105

## MAGNETIC RECORDING

Continuous recording of the ECG according to the  
Holter method N81-31834

## MALES

The effects of gender and instructions on  
calibration [AD-A102255] N81-31844

## MAN ENVIRONMENT INTERACTIONS

Modeling the human controller in environments that  
include continuous and discrete tasks A81-46453

## MAN MACHINE SYSTEMS

Derivation of human pilot control laws based on  
literal interpretation of pilot training  
literature [AIAA 81-1822] A81-44137  
Modeling the human controller in environments that  
include continuous and discrete tasks A81-46453  
Aircraft control-display analysis and design using  
the optimal control model of the human pilot A81-46456  
Video terminals and informational interaction  
/Engineering and psychological aspects/ ---  
Russian book A81-46923

Assessment of the use of human factors in the  
design of fossil-fired steam-generating systems  
[EPRI-CS-1760] N81-30799  
Pilot interaction with automated airborne decision  
making systems [NASA-CR-164729] N81-31847  
Man and machine. An ergonomic perspective on  
various abilities, objectives and work patterns  
in the development of the system [FOA-C-56020-B9] N81-31857

## MANIPULATORS

A three roll wrist robot  
[SME PAPER MS80-699] A81-45666

## MANUAL CONTROL

Derivation of human pilot control laws based on  
literal interpretation of pilot training  
literature [AIAA 81-1822] A81-44137  
An improved approach to predicting pilot rating  
behavior A81-46282  
Modeling the human controller in environments that  
include continuous and discrete tasks A81-46453

## MARINE BIOLOGY

Records of Australian fouling organisms: Sessile  
barnacles (crustacea, cirripedia) [NRL-R-809] N81-31809

## MECHANICAL IMPEDANCE

On the application of a TV-multipoint x-y tracker  
to the measurement of the transmissibility of  
human vibration --- a mechanical impedance model N81-31846

## MEDICAL ELECTRONICS

Digital image processing of two dimensional  
echocardiograms - Identification of the  
endocardium A81-46524

## MEDICAL EQUIPMENT

Experimental investigations and new  
instrumentation for Nd:YAG laser treatment in  
urology [MBB-UA-517/79-OE] N81-30794

## METABOLISM

Effects of the Cosmos 1129 Soviet paste diet on  
body composition in the growing rat  
[NASA-CR-164725] N81-31810

# METABOLITES

# SUBJECT INDEX

## METABOLITES

Quantification through the surface EMG of muscle fatigue and recovery during successive isometric contractions  
N81-47107

**METHOXY SYSTEMS**  
Repair and cell cycle response in cells exposed to environmental biohazards  
[DOE/EV-04568/T1]  
N81-31814

**MICROBIOLOGY**  
Novel approach to the growth of anaerobic microorganisms  
[CONF-810554-1]  
N81-30790

**MICROCOMPUTERS**  
A microcomputer based facility for psychoacoustic experimentation --- human factors engineering, warning systems  
[ISVR-TR-109]  
N81-30797

**MICROORGANISMS**  
Novel approach to the growth of anaerobic microorganisms  
[CONF-810554-1]  
N81-30790

**MILITARY AIRCRAFT**  
Aircraft shielding to fast neutrons from nuclear detonations  
[AD-A102239]  
N81-31820

**MILITARY OPERATIONS**  
Human performance in continuous operations: Description of a simulation model and user's manual for evaluation of performance degradation  
[AD-A101950]  
N81-31856

**MOLECULAR ABSORPTION**  
Biochemical chromophores and the interstellar extinction at ultraviolet wavelengths  
N81-30800

**MOLECULAR BIOLOGY**  
Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model  
[CONF-800944-7]  
N81-31823

**MORTALITY**  
Comparison of survival times under rising and fixed temperature conditions  
N81-44856

**MOTION PERCEPTION**  
Exterospic component of the motion parallax field  
N81-44270  
Motion sensitivity measured by a psychophysical linearizing technique  
N81-44271  
Perceived direction of motion under retinal image stabilization  
N81-46199

**MUSCULAR FATIGUE**  
Respiratory muscle fatigue during cardiogenic shock  
N81-45177  
Quantification through the surface EMG of muscle fatigue and recovery during successive isometric contractions  
N81-47107

**MUSCULAR STRENGTH**  
Active muscle force and moment response of the human arm and shoulder  
N81-47103

**MUSCULOSKELETAL SYSTEM**  
Age-related reactions of rat bones to their unloading --- effect of simulated weightlessness  
N81-47108

**MUTATIONS**  
Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction  
N81-30787

**MYOCARDIAL INFARCTION**  
Echocardiography in aviation medicine  
N81-31831  
Prevention of cardiovascular diseases  
N81-31836  
Cardiovascular problems during the pilots career  
N81-31837

**N**

**NAP-OF-THE-EARTH NAVIGATION**  
Comparison of helicopter copilot workload while using three navigation systems during nap-of-the-earth flight  
N81-46616

**NASA PROGRAMS**  
Life sciences flight experiments program - Overview  
N81-44386

**NAVIGATORS**  
Hearing impaired aviators in the U.S. Army  
N81-31471

**NEODYMIUM LASERS**  
Experimental investigations and new instrumentation for Nd:YAG laser treatment in urology  
[MBB-UA-517/79-08]  
N81-30794

**NERVES**  
Heteroclinic waves of the Fitzhugh-Nagumo equations --- nerve impulse propagation  
[MC-TW-209/80]  
N81-30795

**NEURONS**  
One way traffic of pulses in a neuron --- axon shape effects  
[MC-TW-213/81]  
N81-30796

**NICKEL**  
Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin  
[CONF-800323-4]  
N81-30793

**NITRATES**  
Biological reduction of nitrate wastewater using fluidized-bed bioreactors  
[CONF-810554-2]  
N81-31812

**NITROGEN COMPOUNDS**  
Metabolism of hydrazine  
[AD-A101849]  
N81-31818

**NITROGEN METABOLISM**  
Metabolism of hydrazine  
[AD-A101849]  
N81-31818

**NOISE (SOUND)**  
The effect of noise on the vestibular system  
N81-31455  
Hearing conservation  
N81-31472

**NOISE MEASUREMENT**  
Ride quality meter  
[NASA-CASE-LAR-12882-1]  
N81-31848

**NOISE METERS**  
Ride quality meter  
[NASA-CASE-LAR-12882-1]  
N81-31848

**NOISE REDUCTION**  
Detectability and annoyance of repetitive impulsive sounds  
N81-46648

**NOISE TOLERANCE**  
Detectability and annoyance of repetitive impulsive sounds  
N81-46648  
Some non-auditory correlates of the hearing threshold levels of an aviation noise-exposed population  
N81-47104

**NORTH ATLANTIC TREATY ORGANIZATION (NATO)**  
NATO regulations on the cardio-vascular system  
N81-31829

**NUCLEAR EXPLOSIONS**  
Aircraft shielding to fast neutrons from nuclear detonations  
[AD-A102239]  
N81-31820

**NUCLEAR MAGNETIC RESONANCE**  
The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance  
N81-47105

**NUTRITIONAL REQUIREMENTS**  
Effects of the Cosmos 1129 Soviet paste diet on body composition in the growing rat  
[NASA-CR-164725]  
N81-31810

## O

**OCULOMETERS**  
Dynamics of two-dimensional eye-head tracking  
[AD-A102369]  
N81-31842

**ONBOARD EQUIPMENT**  
Aircraft shielding to fast neutrons from nuclear detonations  
[AD-A102239]  
N81-31820

**OPERATOR PERFORMANCE**  
Psychophysiological and other factors affecting human performance in accident prevention and investigation  
N81-46324

Video terminals and informational interaction  
/Engineering and psychological aspects/ ---  
Russian book A81-46923

**OPTICAL CORRECTION PROCEDURE**  
Personal visual aids for aircrew  
[AGARD-LS-115] N81-31849

**OPTICAL TRACKING**  
Dynamics of two-dimensional eye-head tracking  
[AD-A102369] N81-31842

**OPTIMAL CONTROL**  
Modeling the human controller in environments that  
include continuous and discrete tasks A81-46453  
Aircraft control-display analysis and design using  
the optimal control model of the human pilot  
A81-46456

**OXYGEN BREATHING**  
The instruction of student pilots in breathing and  
speaking at excess oxygen pressures A81-44475

**OXYGEN TENSION**  
The instruction of student pilots in breathing and  
speaking at excess oxygen pressures A81-44475

**OZONE**  
An in vitro system for assessing lung cell  
response to ozone A81-46939

**P**

**PARALLAX**  
Exterspecific component of the motion parallax  
field A81-44270

**PELVIS**  
Functional characteristics of cardiovascular  
system response to head-pelvis overloads A81-44892

**PEPTIDES**  
Cyanamide mediated syntheses of peptides  
containing histidine and hydrophobic amino acids  
A81-45497

**PERFORMANCE PREDICTION**  
An improved approach to predicting pilot rating  
behavior A81-46282

**PERIPHERAL CIRCULATION**  
The influence of lower body negative pressure  
tests on peripheral hemodynamics indicators  
A81-44895

**PERSONALITY TESTS**  
The effects of gender and instructions on  
calibration [AD-A102255] N81-31844

**PERSONNEL SELECTION**  
Sixth advanced operational aviation medicine course  
[AGARD-R-681] N81-31827

**PHONOCARDIOGRAPHY**  
The application of cardiograms in the valuation of  
navigation personnel N81-31830

**PHYSICAL EXERCISE**  
The influence of arm work in the antiorthostatic  
position on indicators of left ventricle activity  
A81-44894  
Exercise training hypotension - Implications for  
plasma volume, renin, and vasopressin A81-45176  
Thermal and glycemic responses during mild  
exercise in +5 to -15 C environments following  
alcohol ingestion A81-47102

**PHYSICAL WORK**  
Biorhythms and work --- Russian book A81-46795

**PHYSIOLOGICAL EFFECTS**  
Life sciences flight experiments program - Overview  
A81-44386  
Some non-auditory correlates of the hearing  
threshold levels of an aviation noise-exposed  
population A81-47104  
Effects of the Cosmos 1129 Soviet paste diet on  
body composition in the growing rat  
[NASA-CR-164725] N81-31810  
Lasers and protection of the eyes N81-31854

**PHYSIOLOGICAL RESPONSES**

The influence of arm work in the antiorthostatic  
position on indicators of left ventricle activity  
A81-44894

The functional condition of the adrenal cortex and  
kidneys of a healthy man during prolonged  
antiorthostatic hypokinesia A81-44896

The regulation of calcium exchange under  
conditions of prolonged antiorthostatic  
hypokinesia A81-44897

Human adaptation mechanisms under high-latitude  
conditions --- Russian book A81-46791

Human ecological physiology. Part 2 - Human  
adaptation to various climato-geographical  
conditions --- Russian book A81-46796

Thermal and glycemic responses during mild  
exercise in +5 to -15 C environments following  
alcohol ingestion A81-47102

Comparison of Eustachian tube function measured by  
the microflow method and a new quantitative  
impedance method A81-47106

Quantification through the surface EMG of muscle  
fatigue and recovery during successive isometric  
contractions A81-47107

Chokes - Favorable response to delayed  
recompression therapy: A case report A81-47110

**PHYSIOLOGICAL TESTS**  
Comparison of survival times under rising and  
fixed temperature conditions A81-44856

Experimental intoxications by PVC thermal  
degradation products - Study of the respiratory  
tract lesions A81-44857

The relative characteristics of continuous and  
intermittent adaptation to high temperatures  
A81-44891

An in vitro system for assessing lung cell  
response to ozone A81-46939

Treadmill testing for the detection of  
asymptomatic coronary disease in the healthy male  
N81-31833

**PHYSIOLOGY**  
Biorhythms and work --- Russian book A81-46795

**PILOT PERFORMANCE**  
An improved approach to predicting pilot rating  
behavior A81-46282  
Aircraft control-display analysis and design using  
the optimal control model of the human pilot  
A81-46456  
Comparison of helicopter copilot workload while  
using three navigation systems during  
nap-of-the-earth flight A81-46616  
Modeling the effects of sustained accelerations on  
pilot tracking performance N81-31839

**PILOT SELECTION**  
Risk of coronary heart disease - Risk analysis in  
the clinical practice of aerospace medicine  
using a programmable calculator A81-47111

**PILOT TRAINING**  
Derivation of human pilot control laws based on  
literal interpretation of pilot training  
literature [AIAA 81-1822] A81-44137  
The instruction of student pilots in breathing and  
speaking at excess oxygen pressures A81-44475  
Augmented feedback in adaptive motor skill training  
A81-46451

**PILOTS**  
Cardiovascular problems during the pilots career  
N81-31837

## POLAR REGIONS

## SUBJECT INDEX

## POLAR REGIONS

Human adaptation mechanisms under high-latitude conditions --- Russian book

A81-46791

## POLYMERIZATION

Synthesis of oligoguanylates on oligocytidylate templates --- on primitive earth

A81-45498

Condensation of activated diguanylates on a Poly/C/ template --- prebiotic polynucleotide replication mechanism

A81-45499

## POLYNUCLEOTIDES

Condensation of activated diguanylates on a Poly/C/ template --- prebiotic polynucleotide replication mechanism

A81-45499

## POLYVINYL CHLORIDE

Experimental intoxications by PVC thermal degradation products - Study of the respiratory tract lesions

A81-44857

## PREVENTION

Epidemiological basis for the prevention of coronary heart disease

N81-31835

Prevention of cardiovascular diseases

N81-31836

## PROJECT SETI

The SETI program plan and instrument development status

N81-31074

## PROTEIN SYNTHESIS

Amino acids of the Murchison meteorite. I - Six carbon acyclic primary alpha-amino alkanolic acids

A81-45495

Reasons for the occurrence of the twenty coded protein amino acids

A81-45496

Cyanamide mediated syntheses of peptides containing histidine and hydrophobic amino acids

A81-45497

Synthesis of oligoguanylates on oligocytidylate templates --- on primitive earth

A81-45498

## PROTOBIOLOGY

Reasons for the occurrence of the twenty coded protein amino acids

A81-45496

Cyanamide mediated syntheses of peptides containing histidine and hydrophobic amino acids

A81-45497

Synthesis of oligoguanylates on oligocytidylate templates --- on primitive earth

A81-45498

Condensation of activated diguanylates on a Poly/C/ template --- prebiotic polynucleotide replication mechanism

A81-45499

## PSYCHOACOUSTICS

Detectability and annoyance of repetitive impulsive sounds

A81-46648

A microcomputer based facility for psychoacoustic experimentation --- human factors engineering, warning systems [ISVR-TR-109]

N81-30797

## PSYCHOLOGICAL FACTORS

Video terminals and informational interaction /Engineering and psychological aspects/ --- Russian book

A81-46923

The effects of gender and instructions on calibration [AD-A102255]

N81-31844

## PSYCHOMOTOR PERFORMANCE

Augmented feedback in adaptive motor skill training

A81-46451

## PSYCHOPHYSICS

Motion sensitivity measured by a psychophysical linearizing technique

A81-44271

Similarity of distorted pictures: On the interaction between edge blur and random noise --- psychophysics [FOA-C-53004-H9]

N81-31845

## PSYCHOPHYSIOLOGY

The instruction of student pilots in breathing and speaking at excess oxygen pressures

A81-44475

Perceived direction of motion under retinal image stabilization

A81-46199

Psychophysiological and other factors affecting human performance in accident prevention and investigation

A81-46324

Training for relaxation. An experiment at the military flight school [FOA-C-59003-H9]

N81-31841

## PUBLIC HEALTH

Doing a risk analysis [CONF-810480-1]

N81-31822

## PULMONARY LESIONS

An in vitro system for assessing lung cell response to ozone

A81-46939

A statistical investigation of the pulmonary effects of exposure of asbestos

N81-31817

## PURSUIT TRACKING

Augmented feedback in adaptive motor skill training

A81-46451

## PYROLYSIS

Experimental intoxications by PVC thermal degradation products - Study of the respiratory tract lesions

A81-44857

## Q

## QUANTITATIVE ANALYSIS

Comparison of Eustachian tube function measured by the microflow method and a new quantitative impedance method

A81-47106

## R

## RADIATION DOSAGE

Toward a theory of the initiation of cancer by ionizing radiation: Track structure analysis for electrons and alpha particles in water [CONF-800944-8]

N81-31821

Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model [CONF-800944-7]

N81-31823

Health effects of low-level radiation [CONF-810606-47]

N81-31824

## RADIATION EFFECTS

Effect of X-rays on the bone marrow cells of white mice under conditions of hypoxia

A81-46825

Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction

N81-30787

Response of bacillus subtilis spores to heavy ion irradiation using cellulose nitrate detectors

N81-30792

Repair and cell cycle response in cells exposed to environmental biohazards [DOE/EV-04568/T1]

N81-31814

Biological effects of ionizing radiation at the molecular, cellular, and organismal levels [DOE/EV-10503/1]

N81-31815

## RADIATION HAZARDS

Health effects of low-level radiation [CONF-810606-47]

N81-31824

An evaluation of radiation emission from video display terminals [PB81-198483]

N81-31826

## RADIATION SHIELDING

Aircrew shielding to fast neutrons from nuclear detonations [AD-A102239]

N81-31820

## RADIO SIGNALS

The SETI program plan and instrument development status

N81-31074

## RADIOACTIVE ISOTOPES

Measurement of normal left atrial function with gated radionuclide angiography

A81-46523

**RADIOACTIVE WASTES**

Volume reduction of solid waste by biological conversion of cellulose  
[ORNL/TM-7653] N81-30791

**RADIOBIOLOGY**

Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction N81-30787

**RANDOM NOISE**

Similarity of distorted pictures: On the interaction between edge blur and random noise --- psychophysics  
[FOA-C-53004-H9] N81-31845

**RATS**

Effects of the Cosmos 1129 Soviet paste diet on body composition in the growing rat  
[NASA-CR-164725] N81-31810

**REACTION KINETICS**

Synthesis of oligoguanylates on oligocytidylate templates --- on primitive earth N81-45498

Condensation of activated diguanylates on a Poly/C/ template --- prebiotic polynucleotide replication mechanism N81-45499

**REFRACTION**

Conventional optical correction of ametropias in aeronautics N81-31850

**REGULATIONS**

NATO regulations on the cardio-vascular system N81-31829

**RELAXATION (PHYSIOLOGY)**

Training for relaxation. An experiment at the military flight school  
[FOA-C-59003-H9] N81-31841

**RENAL FUNCTION**

The functional condition of the adrenal cortex and kidneys of a healthy man during prolonged antiorthostatic hypokinesia N81-44896

The regulation of calcium exchange under conditions of prolonged antiorthostatic hypokinesia N81-44897

**RESPIRATION**

Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure N81-44859

The application of cardiograms in the valuation of navigation personnel N81-31830

**RESPIRATORY PHYSIOLOGY**

Physiological mechanisms for the adaptation of the respiratory regulation system to acute high-altitude hypoxia N81-44890

Respiratory muscle fatigue during cardiogenic shock N81-45177

Chokes - Favorable response to delayed recompression therapy: A case report N81-47110

**RESPIRATORY SYSTEM**

Experimental intoxications by PVC thermal degradation products - Study of the respiratory tract lesions N81-44857

**RETINAL IMAGES**

Motion sensitivity measured by a psychophysical linearizing technique N81-44271

Perceived direction of motion under retinal image stabilization N81-46199

**RHYTHM (BIOLOGY)**

Biorhythms and work --- Russian book N81-46795

**RIDING QUALITY**

Ride quality meter  
[NASA-CASE-LAR-12882-1] N81-31848

**RISK**

Doing a risk analysis  
[CONF-810480-1] N81-31822

Epidemiological basis for the prevention of coronary heart disease N81-31835

**ROBOTS**

Touch-sensing technology - A review  
[SME PAPER MSR80-03,] N81-44651  
Proceedings of NBS/Air Force ICAM workshop on robot interfaces  
[SME PAPER MSR80-06] N81-45664  
A three roll wrist robot  
[SME PAPER MSR80-699] N81-45666

**S****SAFETY FACTORS**

Potential health and safety impacts from distribution storage alcohol fuels  
[ANL/CNSV/TM-61] N81-30789

**SAFETY MANAGEMENT**

Assessment of the use of human factors in the design of fossil-fired steam-generating systems  
[EPRI-CS-1760] N81-30799

Hearing conservation N81-31472

Doing a risk analysis  
[CONF-810480-1] N81-31822

**SEDIMENTS**

Records of Australian fouling organisms: Sessile barnacles (crustacea, cirripedia)  
[NRL-R-809] N81-31809

**SENSORI MOTOR PERFORMANCE**

The effects of altered sensory input on a skilled motor task N81-31840

Neuronal adaptive mechanisms underlying intelligent information processing  
[AD-A101908] N81-31843

**SENSORY FEEDBACK**

Augmented feedback in adaptive motor skill training N81-46451

**SENSORY PERCEPTION**

Touch-sensing technology - A review.  
[SME PAPER MSR80-03,] N81-44651

**SERVOCONTROL**

Proceedings of NBS/Air Force ICAM workshop on robot interfaces  
[SME PAPER MSR80-06] N81-45664

**SHELLS (STRUCTURAL FORMS)**

Records of Australian fouling organisms: Sessile barnacles (crustacea, cirripedia)  
[NRL-R-809] N81-31809

**SHOCK (PHYSIOLOGY)**

Respiratory muscle fatigue during cardiogenic shock N81-45177

**SHOULDERS**

Active muscle force and moment response of the human arm and shoulder N81-47103

**SKIN (ANATOMY)**

Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin  
[CONF-800323-4] N81-30793

Comparison between the heat loss and heat gain through the lungs and body surface during hypothermia and its treatment  
[DRIC-T-6307] N81-31825

**SOCIAL FACTORS**

Epidemiological basis for the prevention of coronary heart disease N81-31835

**SOLID WASTES**

Volume reduction of solid waste by biological conversion of cellulose  
[ORNL/TM-7653] N81-30791

**SPACE COLONIES**

Space life sciences N81-45671

**SPACE FLIGHT FEEDING**

A closed ecosystem for space colonies N81-44037

**SPACE FLIGHT STRESS**

Effects of the Cosmos 1129 Soviet paste diet on body composition in the growing rat  
[NASA-CR-164725] N81-31810

**SPACE STATIONS**

A closed ecosystem for space colonies N81-44037

**SPACE TRANSPORTATION SYSTEM 3 FLIGHT**

Biochemical assays of cultured cells --- space shuttle oft-3  
[NASA-CR-161079] N81-30788

# SPACELAB PAYLOADS

## SPACELAB PAYLOADS

Life sciences flight experiments program - Overview  
A81-44386

**SPATIAL RESOLUTION**  
Latency of the perceived offset of brief target gratings --- visual perception and spatial resolution  
A81-46198

**SPORES**  
Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction  
N81-30787  
Response of bacillus subtilis spores to heavy ion irradiation using cellulose nitrate detectors  
N81-30792

**STANDARDIZATION**  
Proceedings of NBS/Air Force ICAM workshop on robot interfaces  
[SME PAPER MSR80-06]  
A81-45664

**STANDARDS**  
Hearing standards for aircrew  
N81-31461  
Hearing conservation  
N81-31472

**STATISTICAL ANALYSIS**  
A statistical investigation of the pulmonary effects of exposure of asbestos  
N81-31817

**SUNGLASSES**  
Eye protection and tinted lenses  
N81-31852

**SURVIVAL**  
Aircrew shielding to fast neutrons from nuclear detonations  
[AD-A102239]  
N81-31820

**SYSTEM EFFECTIVENESS**  
Assessing the effectiveness of auditory warnings  
N81-31457

**SYSTOLE**  
The application of cardiograms in the valuation of navigation personnel  
N81-31830

**SYSTOLIC PRESSURE**  
The application of cardiograms in the valuation of navigation personnel  
N81-31830

# T

**TACHISTOSCOPES**  
Latency of the perceived offset of brief target gratings --- visual perception and spatial resolution  
A81-46198

**TACHYCARDIA**  
The Wolff-Parkinson-White pattern in healthy aircrew --- heart disease diagnostics  
A81-47109

**TACTILE DISCRIMINATION**  
Touch-sensing technology - A review  
[SME PAPER MSR80-03,]  
A81-44651

**TALKING**  
The instruction of student pilots in breathing and speaking at excess oxygen pressures  
A81-44475

**TASK COMPLEXITY**  
Modeling the human controller in environments that include continuous and discrete tasks  
A81-46453

**TECHNOLOGY ASSESSMENT**  
Touch-sensing technology - A review  
[SME PAPER MSR80-03,]  
A81-44651

**TEMPERATURE EFFECTS**  
Comparison of survival times under rising and fixed temperature conditions  
A81-44856

**TEMPORAL RESOLUTION**  
Latency of the perceived offset of brief target gratings --- visual perception and spatial resolution  
A81-46198

**THERMAL COMFORT**  
The relative characteristics of continuous and intermittent adaptation to high temperatures  
A81-44891  
The regulation of cardiovascular system activity during transient thermal stress  
A81-44893

# SUBJECT INDEX

## THERMORECEPTORS

Is the central control of temperature stability the paradigm of homeostasis /Discussion of theories and evidence/  
A81-44175

**THERMOREGULATION**  
Is the central control of temperature stability the paradigm of homeostasis /Discussion of theories and evidence/  
A81-44175

**THERSHOLDS (PERCEPTION)**  
Hearing standards for aircrew  
N81-31461

**TOLERANCES (PHYSIOLOGY)**  
Detectability and annoyance of repetitive impulsive sounds  
A81-46648

**TOXIC HAZARDS**  
Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure  
A81-44859

**TOXICITY**  
Comparison of survival times under rising and fixed temperature conditions  
A81-44856  
Experimental intoxications by PVC thermal degradation products - Study of the respiratory tract lesions  
A81-44857

**TRACKING RADAR**  
The SETI program plan and instrument development status  
N81-31074

**TRAINING DEVICES**  
Augmented feedback in adaptive motor skill training  
A81-46451

**TREADMILLS**  
Treadmill testing for the detection of asymptomatic coronary disease in the healthy male  
N81-31833

**TUMORS**  
Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin  
[CONF-800323-4]  
N81-30793

**TWO DIMENSIONAL BODIES**  
Dynamics of two-dimensional eye-head tracking  
[AD-A102369]  
N81-31842

# U

**ULTRAVIOLET RADIATION**  
Repair and cell cycle response in cells exposed to environmental biohazards  
[DOE/EV-04568/T1]  
N81-31814

**ULTRAVIOLET SPECTRA**  
Biochemical chromophores and the interstellar extinction at ultraviolet wavelengths  
N81-30800

**UROLOGY**  
Experimental investigations and new instrumentation for Nd:YAG laser treatment in urology  
[MBB-UA-517/79-OE]  
N81-30794

# V

**VESTIBULAR NYSTAGMUS**  
The effect of noise on the vestibular system  
N81-31455

**VIBRATION MEASUREMENT**  
Ride quality meter  
[NASA-CASE-LAR-12882-1]  
N81-31848

**VIBRATION METERS**  
Ride quality meter  
[NASA-CASE-LAR-12882-1]  
N81-31848

**VIBRATION TESTS**  
On the application of a TV-multipoint x-y tracker to the measurement of the transmissibility of human vibration --- a mechanical impedance model  
N81-31846

**VIDEO EQUIPMENT**  
Video terminals and informational interaction /Engineering and psychological aspects/ --- Russian book  
A81-46923  
An evaluation of radiation emission from video display terminals  
[PB81-198483]  
N81-31826

## VIBROSES

Membrane-membrane interactions in a  
lipid-containing bacteriophage system  
[ DOE/EV-03211/32 ] N81-31813

## VISIBILITY

Problems arising from the wearing of head equipment  
N81-31853

## VISION

Personal visual aids for aircrew  
[ AGARD-LS-115 ] N81-31849  
Problems arising from the wearing of head equipment  
N81-31853  
Problems in aeronautics posed by visual deficiencies  
N81-31855

## VISUAL AIDS

Personal visual aids for aircrew  
[ AGARD-LS-115 ] N81-31849

## VISUAL DISCRIMINATION

Perceived direction of motion under retinal image  
stabilization  
A81-46199

## VISUAL PERCEPTION

Exterspecific component of the motion parallax  
field  
A81-44270  
Motion sensitivity measured by a psychophysical  
linearizing technique  
A81-44271  
Latency of the perceived offset of brief target  
gratings --- visual perception and spatial  
resolution  
A81-46198  
Modeling the effects of sustained accelerations on  
pilot tracking performance  
N81-31839  
The effects of altered sensory input on a skilled  
motor task  
N81-31840  
Dynamics of two-dimensional eye-head tracking  
[ AD-A102369 ] N81-31842  
Conventional optical correction of ametropias in  
aeronautics  
N81-31850

## W

## WALKING

The effects of altered sensory input on a skilled  
motor task  
N81-31840

## WARNING SYSTEMS

A microcomputer based facility for psychoacoustic  
experimentation --- human factors engineering,  
warning systems  
[ ISVR-TR-109 ] N81-30797  
Assessing the effectiveness of auditory warnings  
N81-31457

## WASTE TREATMENT

Biological reduction of nitrate wastewater using  
fluidized-bed bioreactors  
[ CONF-810554-2 ] N81-31812

## WATER TREATMENT

Biological reduction of nitrate wastewater using  
fluidized-bed bioreactors  
[ CONF-810554-2 ] N81-31812

## WAVE PROPAGATION

Heteroclinic waves of the Fitzhugh-Nagumo equations  
--- nerve impulse propagation  
[ MC-TW-209/80 ] N81-30795

## WEIGHTLESSNESS

Effects of the Cosmos 1129 Soviet paste diet on  
body composition in the growing rat  
[ NASA-CR-164725 ] N81-31810

## WEIGHTLESSNESS SIMULATION

Age-related reactions of rat bones to their  
unloading --- effect of simulated weightlessness  
A81-47108

## WORKLOADS (PSYCHOPHYSIOLOGY)

Comparison of helicopter copilot workload while  
using three navigation systems during  
nap-of-the-earth flight  
A81-46616

## WRIST

A three roll wrist robot  
[ SME PAPER MS80-699 ] A81-45666

## X

## X RAY IRRADIATION

Effect of X-rays on the bone marrow cells of white  
mice under conditions of hypoxia  
A81-46825

## Y

## YAG LASERS

Experimental investigations and new  
instrumentation for Nd:YAG laser treatment in  
urology  
[ MBB-UA-517/79-OE ] N81-30794



**Page intentionally left blank**

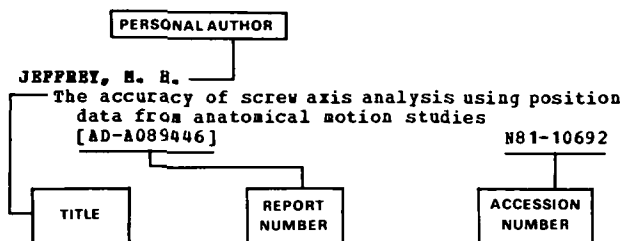
**Page intentionally left blank**

# PERSONAL AUTHOR INDEX

AEROSPACE MEDICINE AND BIOLOGY / *A Continuing Bibliography (Suppl. 226)*

DECEMBER 1981

## Typical Personal Author Index Listing



The title of the document is used to provide the user with a brief description of the subject matter. The NASA or AIAA accession number is included in each entry to assist the user in locating the abstract in the abstract section of this supplement. If applicable, a report number is also included as an aid in identifying the document.

## A

- ADLER, H. I.**  
Novel approach to the growth of anaerobic microorganisms  
[CONF-810554-1] N81-30790
- ALBUS, J.**  
Proceedings of NBS/Air Force ICAM workshop on robot interfaces  
[SME PAPER MSR80-06] A81-45664
- ARTANONOVA, M. P.**  
Functional characteristics of cardiovascular system response to head-pelvis overloads  
A81-44892
- ATKINSON, E. N.**  
A statistical investigation of the pulmonary effects of exposure of asbestos  
N81-31817
- AUBIER, M.**  
Respiratory muscle fatigue during cardiogenic shock  
A81-45177
- AUXIER, J. A.**  
Health effects of low-level radiation  
[CONF-810606-47] N81-31824

## B

- BACHMAN, S.**  
Effect of aging on the electrocardiogram  
A81-46525
- BAKER, J. E.**  
Assessment of the use of human factors in the design of fossil-fired steam-generating systems  
[EPRI-CS-1760] N81-30799
- BANDER, J.**  
Sixth advanced operational aviation medicine course  
[AGARD-R-681] N81-31827
- BARLOW, G. H.**  
Biochemical assays of cultured cells  
[NASA-CR-161079] N81-30788
- BELLOSSI, A.**  
The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance  
A81-47105
- BELLOSSI, G.**  
The effect of a constant and uniform magnetic field on mouse brain - A study by magnetic nuclear resonance  
A81-47105

- BERMAN, A. L.**  
The SETI program plan and instrument development status  
N81-31074
- BERRY, W. R.**  
Life sciences flight experiments program - Overview  
A81-44386
- BEVERLEY, K. I.**  
Motion sensitivity measured by a psychophysical linearizing technique  
A81-44271
- BILLEN, D.**  
Repair and cell cycle response in cells exposed to environmental biohazards  
[DOE/EV-04568/T1] N81-31814
- BLIGH, J.**  
Is the central control of temperature stability the paradigm of homeostasis /Discussion of theories and evidence/  
A81-44175
- BOUGH, E. W.**  
Measurement of normal left atrial function with gated radionuclide angiography  
A81-46523
- BRENNAN, D. H.**  
Lasers and protection of the eyes  
N81-31854
- BRESLAV, I. S.**  
Physiological mechanisms for the adaptation of the respiratory regulation system to acute high-altitude hypoxia  
A81-44890
- BRIDSON, P. K.**  
Condensation of activated diguanylates on a Poly/C/ template  
A81-45499
- BROCK, P. J.**  
Exercise training hypotension - Implications for plasma volume, renin, and vasopressin  
A81-45176
- BRODERICK, D. J.**  
Metabolism of hydrazine  
[AD-A101849] N81-31818
- BUECKER, H.**  
Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction  
N81-30787
- BUECKER, H.**  
Response of bacillus subtilis spores to heavy ion irradiation using cellulose nitrate detectors  
N81-30792

## C

- CARRE, R.**  
The application of cardiograms in the valuation of navigation personnel  
N81-31830
- CARRE, R.**  
Principal electrocardiographic anomalies in the valuation of navigation personnel  
N81-31832
- CHESTUKHIN, V. V.**  
The influence of arm work in the antiorthostatic position on indicators of left ventricle activity  
A81-44894
- CHEVALDERAUD, J. P.**  
Problems in aeronautics posed by visual deficiencies  
N81-31855
- CHILD, J. S.**  
Digital image processing of two dimensional echocardiograms - Identification of the endocardium  
A81-46524

- CLEVENSON, S. A.  
Ride quality meter  
[NASA-CASE-LAR-12882-1] N81-31848
- COOKE, J. M. C.  
Cardiovascular problems during the pilots career N81-31837
- COTE, D. O.  
Augmented feedback in adaptive motor skill training A81-46451  
Comparison of helicopter copilot workload while  
using three navigation systems during  
nap-of-the-earth flight A81-46616
- CRAIK, R. L.  
The effects of altered sensory input on a skilled  
motor task N81-31840
- CROMIE, J. R.  
Amino acids of the Murchison meteorite. I - Six  
carbon acyclic primary alpha-amino alkanolic acids A81-45495
- CROW, R. B.  
The SETI program plan and instrument development  
status N81-31074
- CROW, W. D.  
Novel approach to the growth of anaerobic  
microorganisms  
[CONF-810554-1] N81-30790

## D

- DANT, C. C.  
Life sciences flight experiments program - Overview A81-44386
- DAVIDOFF, R.  
The Wolff-Parkinson-White pattern in healthy aircrew A81-47109
- DE CERTAINES, J.  
The effect of a constant and uniform magnetic  
field on mouse brain - A study by magnetic  
nuclear resonance A81-47105
- DEBACKER, G.  
Epidemiological basis for the prevention of  
coronary heart disease N81-31835
- DEMPSBY, T. K.  
Ride quality meter  
[NASA-CASE-LAR-12882-1] N81-31848
- DES MARAIS, D. J.  
The carbon isotope biogeochemistry of the  
individual hydrocarbons in bat guano and the  
ecology of the insectivorous bats in the region  
of Carlsbad, New Mexico A81-44066
- DETRY, J. M. R.  
Non-invasive evaluation of the coronary circulation N81-31828
- DEVIDZE, M. A.  
Effect of X-rays on the bone marrow cells of white  
mice under conditions of hypoxia A81-46825
- DOROKHOVA, B. R.  
The regulation of calcium exchange under  
conditions of prolonged antiorthostatic  
hypokinesia A81-44897
- DOST, P. M.  
Metabolism of hydrazine  
[AD-A101849] N81-31818
- DRONIOU, J.  
Echocardiography in aviation medicine N81-31831

## E

- E., E.  
NATO regulations on the cardio-vascular system N81-31829
- ENGIN, A. E.  
Active muscle force and moment response of the  
human arm and shoulder A81-47103
- EVERETT, W. D.  
Risk of coronary heart disease - Risk analysis in  
the clinical practice of aerospace medicine  
using a programmable calculator A81-47111

## F

- FACIUS, R.  
Response of bacillus subtilis spores to heavy ion  
irradiation using cellulose nitrate detectors N81-30792
- FAKHRAI, R.  
Synthesis of oligoguanylates on oligocytidylate  
templates A81-45498
- FIDELL, S.  
Detectability and annoyance of repetitive  
impulsive sounds A81-46648
- FISCHOFF, B.  
The effects of gender and instructions on  
calibration [AD-A102255] N81-31844
- FLICK, C. F.  
Heat stress in the A-10 cockpit - Flights over  
desert A81-47101
- FORGIE, R. E.  
Problems arising from the wearing of head equipment N81-31853
- FOUET, C.  
Experimental intoxications by PVC thermal  
degradation products - Study of the respiratory  
tract lesions A81-44857
- FRANK, P.  
Experimental investigations and new  
instrumentation for Nd:YAG laser treatment in  
urology [MBB-UA-517/79-0E] N81-30794
- FRANK, M.  
A three roll wrist robot  
[SME PAPER MS80-699] A81-45666
- FROMELICH, G. M.  
Effects of age, flying time and type of aircraft  
on the hearing of German military pilots, and  
its significance for inflight communication N81-31469
- FURUSTING, H.  
Man and machine. An ergonomic perspective on  
various abilities, objectives and work patterns  
in the development of the system [FOA-C-56020-H9] N81-31857

## G

- GAMBASHIDZE, G. M.  
Biorhythms and work A81-46795
- GANDSMAN, E. J.  
Measurement of normal left atrial function with  
gated radionuclide angiography A81-46523
- GANDY, W. E.  
Amino acids of the Murchison meteorite. I - Six  
carbon acyclic primary alpha-amino alkanolic acids A81-45495
- GASPER, J. R.  
Potential health and safety impacts from  
distribution storage alcohol fuels  
[ANL/CNSV/TM-61] N81-30789
- GAUME, J. G.  
Initial tests of the combined ECG/Ti animal  
systems using carbon monoxide exposure A81-44859
- GILDERA, T. J.  
Latency of the perceived offset of brief target  
gratings A81-46198
- GLOUDEMANS, M. P. C.  
Hearing standards for aircrew N81-31461
- GOETHE, H.  
Comparison between the heat loss and heat gain  
through the lungs and body surface during  
hypothermia and its treatment [DRIC-T-6307] N81-31825
- GOLDSTEIN, J. L.  
Hearing impaired aviators in the U.S. Army N81-31471

GOVINDARAJ, T.  
Modeling the human controller in environments that include continuous and discrete tasks  
A81-46453

GRAHAM, T. E.  
Thermal and glycemic responses during mild exercise in +5 to -15 C environments following alcohol ingestion  
A81-47102

GREENLEAF, J. E.  
Exercise training hypotension - Implications for plasma volume, renin, and vasopressin  
A81-45176

GREENSTEIN, A.  
Chokes - Favorable response to delayed recompression therapy: A case report  
A81-47110

GRIGOREV, A. I.  
The regulation of calcium exchange under conditions of prolonged antiorthostatic hypokinesia  
A81-44897

GROTH, P.  
Comparison of Eustachian tube function measured by the microflow method and a new quantitative impedance method  
A81-47106

## H

HADDEW, C. T.  
Repair and cell cycle response in cells exposed to environmental biohazards  
[DOE/EV-04568/T1]  
N81-31814

HAGAR, W. L.  
An in vitro system for assessing lung cell response to ozone  
A81-46939

HALFORD, R. J.  
A microcomputer based facility for psychoacoustic experimentation  
[ISVR-TR-109]  
N81-30797

HANCHER, C. W.  
Biological reduction of nitrate wastewater using fluidized-bed bioreactors  
[CONF-810554-2]  
N81-31812

HARMON, L. D.  
Touch-sensing technology - A review  
[SHE PAPER MSR80-03,]  
A81-44651

HAWKER, J. E., JR.  
Cyanamide mediated syntheses of peptides containing histidine and hydrophobic amino acids  
A81-45497

HAYES, J. H.  
The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico  
A81-44066

HEPFLEY, R. K.  
Derivation of human pilot control laws based on literal interpretation of pilot training literature  
[AIAA 81-1822]  
A81-44137

HESS, R. A.  
Aircraft control-display analysis and design using the optimal control model of the human pilot  
A81-46456

HICKMAN, J. E., JR.  
Treadmill testing for the detection of asymptomatic coronary disease in the healthy male  
N81-31833  
Disposition of electrocardiographic abnormalities in aviation  
N81-31838

HILADO, C. J.  
Comparison of survival times under rising and fixed temperature conditions  
A81-44856

HOFSTETTER, A.  
Experimental investigations and new instrumentation for Nd:YAG laser treatment in urology  
[NBB-UA-517/79-08]  
N81-30794

HOGGER, E. G.  
Some non-auditory correlates of the hearing threshold levels of an aviation noise-exposed population  
A81-47104

HORNECK, G.  
Effects of accelerated heavy ions on bacillus subtilis spores: Inactivation, repair and mutation induction  
N81-30787

HOROHJEFF, R.  
Detectability and annoyance of repetitive impulsive sounds  
A81-46648

HOYLE, F.  
Biochemical chromophores and the interstellar extinction at ultraviolet wavelengths  
N81-30800

HUTTLINGER, P. A.  
Comparison of survival times under rising and fixed temperature conditions  
A81-44856

## I

IAKOVELEVA, V. A.  
The influence of arm work in the antiorthostatic position on indicators of left ventricle activity  
A81-44894

IARULLIN, KH. KH.  
Functional characteristics of cardiovascular system response to head-pelvis overloads  
A81-44892

ILIN, E. A.  
Age-related reactions of rat bones to their unloading  
A81-47108

INHABER, H.  
Doing a risk analysis  
[CONF-810480-1]  
N81-31822

IVARSSON, A.  
Comparison of Eustachian tube function measured by the microflow method and a new quantitative impedance method  
A81-47106

## J

JOVANY, J. H.  
Experimental intoxications by PVC thermal degradation products - Study of the respiratory tract lesions  
A81-44857

## K

KABESHEVA, T. A.  
The influence of lower body negative pressure tests on peripheral hemodynamics indicators  
A81-44895

KALKO, T. F.  
Physiological mechanisms for the adaptation of the respiratory regulation system to acute high-altitude hypoxia  
A81-44890

KANAGASABAY, S.  
Hearing conservation  
N81-31472

KAPSHUK, A. P.  
Biorhythms and work  
A81-46795

KARPENKO, A. V.  
Biorhythms and work  
A81-46795

KATKOV, V. E.  
The influence of arm work in the antiorthostatic position on indicators of left ventricle activity  
A81-44894

KAURICHEVA, N. I.  
The influence of arm work in the antiorthostatic position on indicators of left ventricle activity  
A81-44894

KAZARIAN, L.  
Active muscle force and moment response of the human arm and shoulder  
A81-47103

KAZNACHEEV, V. P.  
Human adaptation mechanisms under high-latitude conditions  
A81-46791

- KEIDITSCH, E.  
Experimental investigations and new instrumentation for Nd:YAG laser treatment in urology  
[MBB-0A-517/79-OE] N81-30794
- KEIL, L. C.  
Exercise training hypotension - Implications for plasma volume, renin, and vasopressin A81-45176
- KESTELOOT, H.  
Prevention of cardiovascular diseases N81-31836
- KHAMZAEV, SH. A.  
Biorhythms and work A81-46795
- KHOVANOV, M. V.  
Biorhythms and work A81-46795
- KLINESTIVER, L. R.  
Psychophysiological and other factors affecting human performance in accident prevention and investigation A81-46324
- KOENDERINK, J. J.  
Extrospecific component of the motion parallax field A81-44270
- KORN, J.  
Modeling the effects of sustained accelerations on pilot tracking performance N81-31839
- KOVALEVA, A. I.  
Biorhythms and work A81-46795
- KOWALCHUK, M.  
Biological reduction of nitrate wastewater using fluidized-bed bioreactors  
[CONF-810554-2] N81-31812
- KRIVAK, B. M.  
Metabolism of hydrazine  
[AD-A101849] N81-31818
- KRUEGER, G. P.  
Comparison of helicopter copilot workload while using three navigation systems during nap-of-the-earth flight A81-46616
- KRUPINA, T. M.  
Functional characteristics of cardiovascular system response to head-pelvis overloads A81-44892
- KUDRIAVTSEVA, V. I.  
Biorhythms and work A81-46795

## L

- LANGE, C. S.  
Biological effects of ionizing radiation at the molecular, cellular, and organismal levels  
[DOE/EV-10503/1] N81-31815
- LEATHERWOOD, J. E.  
Ride quality meter  
[NASA-CASE-LAR-12882-1] N81-31848
- LEGUAY, G.  
Cardiac arrhythmias in space - Role of vagotonia A81-44800
- Echocardiography in aviation medicine N81-31831
- Continuous recording of the ECG according to the Holter method N81-31834
- LEWIS, J. A.  
Records of Australian fouling organisms: Sessile barnacles (crustacea, cirripedia)  
[MBL-R-809] N81-31809
- LICHTENSTEIN, S.  
The effects of gender and instructions on calibration  
[AD-A102255] N81-31844
- LIPP, S.  
Hearing impaired aviators in the U.S. Army N81-31471
- LINDE, L.  
Similarity of distorted pictures: On the interaction between edge blur and random noise  
[FOA-C-53004-H9] N81-31845

- LOERMANN, R.  
Condensation of activated diguanylates on a Poly/C/ template A81-45499
- LONG, G. M.  
Latency of the perceived offset of brief target gratings A81-46198
- LOW, A.  
Comparison between the heat loss and heat gain through the lungs and body surface during hypothermia and its treatment  
[DRIC-T-6307] N81-31825
- LOZINSKII, V. S.  
The instruction of student pilots in breathing and speaking at excess oxygen pressures A81-44475

## M

- MARENT, P. J.  
Conventional optical correction of ametropias in aeronautics N81-31850
- MANFIELD, R. J. W.  
Perceived direction of motion under retinal image stabilization A81-46199
- MARIANOVICH, A. T.  
The relative characteristics of continuous and intermittent adaptation to high temperatures A81-44891
- MARSHALL, J. H.  
Toward a theory of the initiation of cancer by ionizing radiation: Track structure analysis for electrons and alpha particles in water  
[CONF-800944-8] N81-31821
- Toward a theory of the initiation of cancer by ionizing radiation. The twin doublet pair model  
[CONF-800944-7] N81-31823
- MARTIN, A. M.  
A microcomputer based facility for psychoacoustic experimentation  
[ISVR-TR-109] N81-30797
- MCHARY, C. A.  
Digital image processing of two dimensional echocardiograms - Identification of the endocardium A81-46524
- MEINSCHWEIN, W. G.  
The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico A81-44066
- MELANED, Y.  
Chokes - Favorable response to delayed recompression therapy: A case report A81-47110
- MELIN, J. A.  
Non-invasive evaluation of the coronary circulation N81-31828
- MEYER, A. U.  
Dynamics of two-dimensional eye-head tracking  
[AD-A102369] N81-31842
- MIKHAILOV, V. M.  
The influence of arm work in the antiorthostatic position on indicators of left ventricle activity A81-44894
- MILLER, S. L.  
Reasons for the occurrence of the twenty coded protein amino acids A81-45496
- MIRBAKHINOV, M. M.  
Physiological mechanisms for the adaptation of the respiratory regulation system to acute high-altitude hypoxia A81-44890
- MITCHELL, J. M.  
The carbon isotope biogeochemistry of the individual hydrocarbons in bat guano and the ecology of the insectivorous bats in the region of Carlsbad, New Mexico A81-44066
- MORUKOV, B. V.  
The regulation of calcium exchange under conditions of prolonged antiorthostatic hypokinesia A81-44897

HYBURGH, D. P.  
The Wolff-Parkinson-White pattern in healthy aircrew  
A81-47109

## N

NACHMIAS, J.  
Perceived direction of motion under retinal image  
stabilization  
A81-46199

NAGEL, R.  
Proceedings of NBS/Air Force ICAM workshop on  
robot interfaces  
[SME PAPER MSR80-06]  
A81-45664

NAVAKATIKIAN, A. O.  
Biorhythms and work  
A81-46795

NESNOW, S.  
Tumorigenesis of diesel exhaust, gasoline exhaust,  
and related emission extracts on SENCAR mouse skin  
[CONF-800323-4]  
N81-30793

NEWTON, P. C.  
Digital image processing of two dimensional  
echocardiograms - Identification of the  
endocardium  
A81-46524

NOGUES, C.  
Experimental intoxications by PVC thermal  
degradation products - Study of the respiratory  
tract lesions  
A81-44857

NOSKOV, V. B.  
The functional condition of the adrenal cortex and  
kidneys of a healthy man during prolonged  
antiorthostatic hypokinesia  
A81-44896

NOVIKOV, V. E.  
Age-related reactions of rat bones to their  
unloading  
A81-47108

NUNNELEY, S. A.  
Heat stress in the A-10 cockpit - Flights over  
desert  
A81-47101

## O

OLIVER, J. A.  
Assessment of the use of human factors in the  
design of fossil-fired steam-generating systems  
[EPRI-CS-1760]  
N81-30799

OOSTERVELD, W. J.  
The effect of noise on the vestibular system  
N81-31455

ORTEL, L. E.  
Synthesis of oligoguanylates on oligocytidylylate  
templates  
A81-45498

Condensation of activated diguanylates on a  
Poly/C/ template  
A81-45499

ORO, J.  
Cyanamide mediated syntheses of peptides  
containing histidine and hydrophobic amino acids  
A81-45497

OSIPOVA, O. V.  
Biorhythms and work  
A81-46795

OZKAPTAN, H.  
Human performance in continuous operations:  
Description of a simulation model and user's  
manual for evaluation of performance degradation  
[AD-A101950]  
N81-31856

## P

PACE, N.  
Effects of the Cosmos 1129 Soviet paste diet on  
body composition in the growing rat  
[NASA-CR-164725]  
N81-31810

PAGNAVENTA, A.  
Toward a theory of the initiation of cancer by  
ionizing radiation: Track structure analysis  
for electrons and alpha particles in water  
[CONF-800944-8]  
N81-31821

Toward a theory of the initiation of cancer by  
ionizing radiation. The twin doublet pair model  
[CONF-800944-7]  
N81-31823

PANFEROVA, N. E.  
The influence of lower body negative pressure  
tests on peripheral hemodynamics indicators  
A81-44895

PATRICK, R. P.  
Aircrew shielding to fast neutrons from nuclear  
detonations  
[AD-A102239]  
N81-31820

PATTON, B. D.  
Biological reduction of nitrate wastewater using  
fluidized-bed bioreactors  
[CONF-810554-2]  
N81-31812

PAUWELUSSEN, J. P.  
Heteroclinic waves of the Fitzhugh-Nagumo equations  
[MC-TW-209/80]  
N81-30795

One way traffic of pulses in a neuron  
[MC-TW-213/81]  
N81-30796

PERDRIEL, G. F.  
The indications of the use of contact lenses in  
aeronautics  
N81-31851

PETROFSKY, J. S.  
Quantification through the surface EMG of muscle  
fatigue and recovery during successive isometric  
contractions  
A81-47107

PICART, P.  
Experimental intoxications by PVC thermal  
degradation products - Study of the respiratory  
tract lesions  
A81-44857

PITTS, G. C.  
Effects of the Cosmos 1129 Soviet paste diet on  
body composition in the growing rat  
[NASA-CR-164725]  
N81-31810

PIZZARELLO, S.  
Amino acids of the Murchison meteorite. I - Six  
carbon acyclic primary alpha-amino alkanolic acids  
A81-45495

POLMAN, A. R.  
The effect of noise on the vestibular system  
N81-31455

## R

RAHLMANN, D. P.  
Effects of the Cosmos 1129 Soviet paste diet on  
body composition in the growing rat  
[NASA-CR-164725]  
N81-31810

REED, D. J.  
Metabolism of hydrazine  
[AD-A101849]  
N81-31818

REGAN, D.  
Motion sensitivity measured by a psychophysical  
linearizing technique  
A81-44271

REIBOLD, R. C.  
Initial tests of the combined ECG/Ti animal  
systems using carbon monoxide exposure  
A81-44859

RICHARDS, I. R.  
A closed ecosystem for space colonies  
A81-44037

ROSENBERG, S. E.  
Potential health and safety impacts from  
distribution storage alcohol fuels  
[ANL/CNSV/TH-61]  
N81-30789

ROTH, J. W.  
Assessment of the use of human factors in the  
design of fossil-fired steam-generating systems  
[EPRI-CS-1760]  
N81-30799

ROUSE, W. B.  
Modeling the human controller in environments that  
include continuous and discrete tasks  
A81-46453

Pilot interaction with automated airborne decision  
making systems  
[NASA-CR-164729]  
N81-31847

ROUSSOS, C.  
Respiratory muscle fatigue during cardiogenic shock  
A81-45177

RUSTAMIAN, L. A.  
The regulation of calcium exchange under  
conditions of prolonged antiorthostatic  
hypokinesia  
A81-44897

## S

- SAPOVA, M. I.  
The regulation of cardiovascular system activity during transient thermal stress  
A81-44893
- SBISA, H. E.  
In support of the Joint Army/Navy Air Crew Impact Injury Prevention Program  
[AD-A102505] N81-31819
- SCHAEFER, M.  
Response of bacillus subtilis spores to heavy ion irradiation using cellulose nitrate detectors  
N81-30792
- SCHAMROTH, C. L.  
The Wolff-Parkinson-White pattern in healthy aircrew  
A81-47109
- SCHOONHEYT, J.  
The effect of noise on the vestibular system  
N81-31455
- SCHORN, A. M.  
Human performance in continuous operations: Description of a simulation model and user's manual for evaluation of performance degradation  
[AD-A101950] N81-31856
- SCHULMAN, T. M.  
Derivation of human pilot control laws based on literal interpretation of pilot training literature  
[AIAA 81-1822] A81-44137
- SCHWARTZ, E.  
On the application of a TV-multipoint x-y tracker to the measurement of the transmissibility of human vibration  
N81-31846
- SCIARAPPA, D.  
Exercise training hypotension - Implications for plasma volume, renin, and vasopressin  
A81-45176
- SEIGNEURIC, A.  
Cardiac arrhythmias in space - Role of vagotonia  
A81-44800  
Continuous recording of the ECG according to the Holter method  
N81-31834
- SHAH, F. M.  
Digital image processing of two dimensional echocardiograms - Identification of the endocardium  
A81-46524
- SHERMAN, D.  
Chokes - Favorable response to delayed recompression therapy: A case report  
A81-47110
- SHULMAN, R. S.  
Measurement of normal left atrial function with gated radionuclide angiography  
A81-46523
- SHULZHENKO, E. B.  
Functional characteristics of cardiovascular system response to head-pelvis overloads  
A81-44892
- SHVARTZ, E.  
Exercise training hypotension - Implications for plasma volume, renin, and vasopressin  
A81-45176
- SIEGEL, A. I.  
Human performance in continuous operations: Description of a simulation model and user's manual for evaluation of performance degradation  
[AD-A101950] N81-31856
- SIMMONS, R. R.  
Comparison of helicopter copilot workload while using three navigation systems during nap-of-the-earth flight  
A81-46616
- SITNICHENKO, IU. K.  
The instruction of student pilots in breathing and speaking at excess oxygen pressures  
A81-44475
- SKORTON, D. J.  
Digital image processing of two dimensional echocardiograms - Identification of the endocardium  
A81-46524
- SLAGA, T. J.  
Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin  
[CONF-800323-4] N81-30793
- SMIRNOV, K. M.  
Biorhythms and work  
A81-46795
- SMITH, A. H.  
Effects of the Cosmos 1129 Soviet paste diet on body composition in the growing rat  
[NASA-CR-164725] N81-31810
- SMITH, L. K.  
Effect of aging on the electrocardiogram  
A81-46525
- SNIPES, W.  
Membrane-membrane interactions in a lipid-containing bacteriophage system  
[DOE/EV-03211/32] N81-31813
- SPARROW, D.  
Effect of aging on the electrocardiogram  
A81-46525
- SPIETH, H. H.  
Initial tests of the combined ECG/Ti animal systems using carbon monoxide exposure  
A81-44859
- STEPHENS, D. G.  
Ride quality meter  
[NASA-CASE-LAR-12882-1] N81-31848
- STRANDBERG, G. W.  
Volume reduction of solid waste by biological conversion of cellulose  
[ORNL/TM-7653] N81-30791
- SVENSSON, E.  
Training for relaxation. An experiment at the military flight school  
[FOA-C-59003-H9] N81-31841
- SWEET, F.  
An in vitro system for assessing lung cell response to ozone  
A81-46939
- SWEET, W. E.  
An in vitro system for assessing lung cell response to ozone  
A81-46939

## T

- TANAKA, K.  
An improved approach to predicting pilot rating behavior  
A81-46282
- THANDERZ, M.  
Training for relaxation. An experiment at the military flight school  
[FOA-C-59003-H9] N81-31841
- THOMAS, G. B.  
Some non-auditory correlates of the hearing threshold levels of an aviation noise-exposed population  
A81-47104
- THORPE, R. W.  
In support of the Joint Army/Navy Air Crew Impact Injury Prevention Program  
[AD-A102505] N81-31819
- TJERNSTROM, O.  
Comparison of Eustachian tube function measured by the microflow method and a new quantitative impedance method  
A81-47106
- TRIPLETT, L. L.  
Tumorigenesis of diesel exhaust, gasoline exhaust, and related emission extracts on SENCAR mouse skin  
[CONF-800323-4] N81-30793
- TRIPPENBACH, T.  
Respiratory muscle fatigue during cardiogenic shock  
A81-45177

## U

- UNESTAAHL, L. E.  
Training for relaxation. An experiment at the military flight school  
[FOA-C-59003-H9] N81-31841



## V

- VAN DOORN, A. J.  
Exterspecific component of the motion parallax  
field  
A81-44270
- VAN ROODE, J. H. G.  
Synthesis of oligoguanylates on oligocytidylate  
templates  
A81-45498
- VASILEVSKII, N. N.  
Human ecological physiology. Part 2 - Human  
adaptation to various climato-geographical  
conditions  
A81-46796
- VENDA, V. F.  
Video terminals and informational interaction  
/Engineering and psychological aspects/  
A81-46923
- VIL-WILLIAMS, I. F.  
Functional characteristics of cardiovascular  
system response to head-pelvis overloads  
A81-44892
- VOGT, L.  
On the application of a TV-multipoint x-y tracker  
to the measurement of the transmissibility of  
human vibration  
N81-31846
- VON BAUMGARTEN, R.  
Space life sciences  
A81-45671

## W

- WALKER, J. F., JR.  
Biological reduction of nitrate wastewater using  
fluidized-bed bioreactors  
[CONF-810554-2]  
N81-31812
- WEBER, A. L.  
Reasons for the occurrence of the twenty coded  
protein amino acids  
A81-45496
- WHEATLEY, T.  
Proceedings of NBS/Air Force ICAM workshop on  
robot interfaces  
[SME PAPER MSR80-06]  
A81-45664
- WICKRAMASINGHE, N. C.  
Biochemical chromophores and the interstellar  
extinction at ultraviolet wavelengths  
N81-30800
- WILKINS, P. A.  
A microcomputer based facility for psychoacoustic  
experimentation  
[ISVR-TR-109]  
N81-30797
- Assessing the effectiveness of auditory warnings  
N81-31457
- WILLIAMS, C. B.  
Some non-auditory correlates of the hearing  
threshold levels of an aviation noise-exposed  
population  
A81-47104
- WILLIGES, B. H.  
Augmented feedback in adaptive motor skill training  
A81-46451
- WILLIGES, R. C.  
Augmented feedback in adaptive motor skill training  
A81-46451
- WOLF, J. J.  
Human performance in continuous operations:  
Description of a simulation model and user's  
manual for evaluation of performance degradation  
[AD-A101950]  
N81-31856
- WOODY, C. D.  
Neuronal adaptive mechanisms underlying  
intelligent information processing  
[AD-A101908]  
N81-31843

## Y

- YONEMURA, G. T.  
Criteria for recommending lighting levels  
[PB81-185126]  
N81-30798

## Z

- ZYBIN, O. KH.  
The influence of arm work in the antiorthostatic  
position on indicators of left ventricle activity  
A81-44894



## PUBLIC COLLECTIONS OF NASA DOCUMENTS

### DOMESTIC

NASA distributes its technical documents and bibliographic tools to eleven special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

#### CALIFORNIA

University of California, Berkeley

#### COLORADO

University of Colorado, Boulder

#### DISTRICT OF COLUMBIA

Library of Congress

#### GEORGIA

Georgia Institute of Technology, Atlanta

#### ILLINOIS

The John Crerar Library, Chicago

#### MASSACHUSETTS

Massachusetts Institute of Technology, Cambridge

#### MISSOURI

Linda Hall Library, Kansas City

#### NEW YORK

Columbia University, New York

#### OKLAHOMA

University of Oklahoma, Bizzell Library

#### PENNSYLVANIA

Carnegie Library of Pittsburgh

#### WASHINGTON

University of Washington, Seattle

NASA publications (those indicated by an "\*" following the accession number) are also received by the following public and free libraries:

#### CALIFORNIA

Los Angeles Public Library

San Diego Public Library

#### COLORADO

Denver Public Library

#### CONNECTICUT

Hartford Public Library

#### MARYLAND

Enoch Pratt Free Library, Baltimore

#### MASSACHUSETTS

Boston Public Library

#### MICHIGAN

Detroit Public Library

#### MINNESOTA

Minneapolis Public Library and Information Center

#### NEW JERSEY

Trenton Public Library

#### NEW YORK

Brooklyn Public Library

Buffalo and Erie County Public Library

Rochester Public Library

New York Public Library

#### OHIO

Akron Public Library

Cincinnati and Hamilton County Public Library

Cleveland Public Library

Dayton Public Library

Toledo and Lucas County Public Library

#### TEXAS

Dallas Public Library

Fort Worth Public Library

#### WASHINGTON

Seattle Public Library

#### WISCONSIN

Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 555 West 57th Street, 12th Floor, New York, New York 10019.

### EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy of microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "\*" and "#", from: ESA - Information Retrieval Service, European Space Agency, 8-10 rue Mario-Nikis, 75738 Paris CEDEX 15, France.



National Aeronautics and  
Space Administration

Washington, D.C.  
20546

Official Business

Penalty for Private Use, \$300

THIRD-CLASS BULK RATE

Postage and Fees Paid  
National Aeronautics and  
Space Administration  
NASA-451



4 1 SP-7011, 122181 S90569AU 850609  
NASA  
SCIEN & TECH INFO FACILITY  
ATTN: ACCESSIONING DEPT  
P O BOX 8757 BWI ARPRT  
BALTIMORE MD 21240



POSTMASTER: If Undeliverable (Section 158  
Postal Manual) Do Not Return

## NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP-7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

*Details on the availability of these publications may be obtained from*

SCIENTIFIC AND TECHNICAL INFORMATION BRANCH

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546